EXHIBIT 1

U.S. Department of
Homeland Security
United States
Coast Guard

U. S. COAST GUARD ADDENDUM

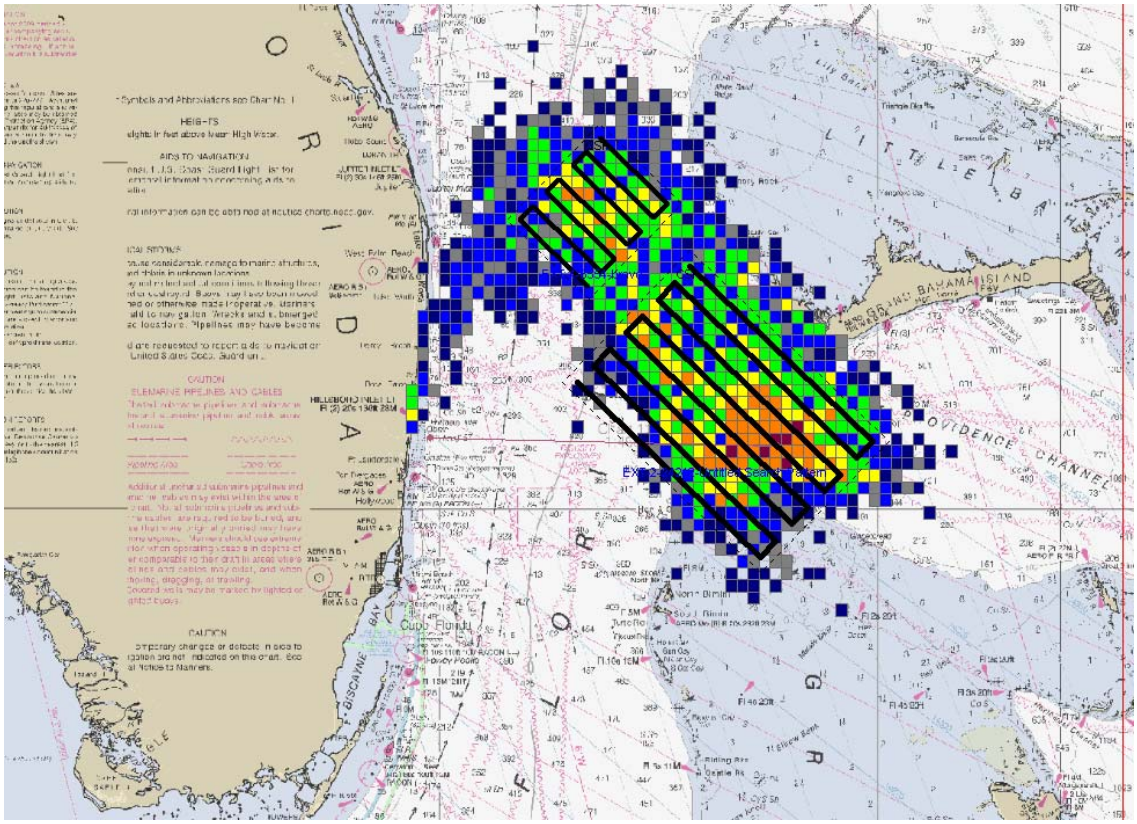
TO THE

UNITED STATES

NATIONAL SEARCH AND RESCUE SUPPLEMENT (NSS)

To The

International Aeronautical and Maritime Search and Rescue Manual (IAMSAR)



COMDTINST M16130.2F

January 2013

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

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COMDTINST M16130.2F

JAN 07, 2013

COMMANDANT INSTRUCTION M16130.2F

Subj: THE U.S. COAST GUARD ADDENDUM TO THE UNITED STATES NATIONAL SEARCH AND RESCUE SUPPLEMENT (NSS) TO THE INTERNATIONAL AERONAUTICAL AND MARITIME SEARCH AND RESCUE MANUAL (IAMSAR)

1. PURPOSE. This Manual is the new Coast Guard Addendum (CGADD) to the United States National Search and Rescue Supplement (NSS), which is a supplement to the International Aeronautical and Maritime Search and Rescue Manual (IAMSAR). This Addendum establishes policy, guidelines, procedures and general information for Coast Guard use in search and rescue (SAR) operations.

2. ACTION. All Coast Guard unit commanders, commanding officers, officers-in-charge, deputy/assistant commandants, and chiefs of headquarters staff elements shall comply with the provisions of this Manual. Internet release is authorized.

3. DIRECTIVES AFFECTED. The U.S. Coast Guard Addendum to the United States Search and Rescue Supplement (NSS) to the International Aeronautical and Maritime Search and Rescue Manual, COMDTINST M16130.2E is cancelled.

4. DISCUSSION.

   a. The CGADD is a Coast Guard publication complementing the NSS and IAMSAR for Coast Guard SAR operations.

   b. The CGADD, NSS and IAMSAR are reference documents for SAR, which are published and revised to incorporate the latest techniques and recommendations for SAR.

   c. This new Addendum includes procedures and information that may be useful to rescue agencies outside of the Coast Guard. As procedures presently incorporated in the CGADD are approved for joint use, they will be published in the NSS. As procedures are approved for international use, they will likewise be published in the IAMSAR. Although the CGADD is a Coast Guard

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policy publication, commands may share the information with other rescue organizations. In the event of apparent conflict between the provisions of this Addendum and other Coast Guard directives, the latest provision shall be applied and Commandant (CG-SAR-1) shall be notified of the apparent conflict.

d. The policies and procedures in this Manual apply to Coast Guard facilities within the U.S., territories, and possessions, and to Coast Guard SAR operations worldwide. This directive promulgates internal Coast Guard planning guidance solely intended to promote efficiency and consistency in public service above and beyond the requirements of law and regulation. Any obligations discussed, flow only to the Coast Guard and Coast Guard personnel are expected to exercise broad discretion in performing the functions discussed. The Coast Guard retains the discretion to deviate from or change this guidance without notice. This document creates no duties, standard of care, or obligations to the public and should not be relied upon as a representation by the Coast Guard as to the manner of proper performance in any particular case.

5. POLICY.

a. Procedures, techniques, and terminology in this Addendum are adopted for use by the Coast Guard for SAR operations. Procedures, techniques, and terminology promulgated by the NSS and IAMSAR also apply to the Coast Guard. Where Coast Guard policies or procedures differ from NSS and IAMSAR manual, discussion and guidance will be provided within the Addendum.

b. The provisions of this Addendum are intended as a guide for consistent and uniform execution of the Coast Guard SAR program. This Addendum does not cover occurrences best handled through experience and sound judgment. The CGADD is not intended to place undue restrictions on use of sound judgment.

6. MAJOR CHANGES. Major changes to this Manual are listed in Appendix O of this Addendum.

7. REQUESTS FOR CHANGES. Units and individuals may submit recommended changes in writing via the chain of command to: Commandant (CG-SAR); U. S. Coast Guard; 2100 2ND ST SW STOP 7363; WASHINGTON, DC 20593-7363.

8. DISCLAIMER. This guidance is not a substitute for applicable legal requirements, nor is it itself a rule. It is intended to provide operational guidance for Coast Guard personnel and is not intended to nor does it impose legally-binding requirements on any party outside the Coast Guard.

9. RECORDS MANAGEMENT CONSIDERATIONS. This Manual has been evaluated for potential records management impacts. The development of this Manual has been thoroughly reviewed during the directives clearance process, and it has been determined there are no further records scheduling requirements, in accordance with Federal Records Act, 44 U.S.C. 3101 et seq., National Archives and Records Administration (NARA) requirements, and the Information and Life Cycle Management Manual, COMDTINST M5212.12 (series). This policy does not have any significant or substantial change to existing records management requirements.

10. ENVIRONMENTAL ASPECT AND IMPACT CONSIDERATIONS.

a. The development of this Manual and the general policies contained within it have been thoroughly reviewed by the originating office in conjunction with the Office of Environmental Management, and are categorically excluded (CE) under current USCG CE # 33 from further environmental analysis, in accordance with Section 2.B.2. and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1 (series). Because this Manual contains guidance on, and provisions for, compliance with applicable environmental mandates, Coast Guard categorical exclusion #33 is appropriate.

b. This directive will not have any of the following: significant cumulative impacts on the human environment; substantial controversy or substantial change to existing environmental conditions; or inconsistencies with any Federal, State, or local laws or administrative determinations relating to the environment. All future specific actions resulting from the general policies in this Manual must be individually evaluated for compliance with the National Environmental Policy Act (NEPA), DHS and Coast Guard NEPA policy, and compliance with all other environmental mandates. Due to the administrative and procedural nature of this Manual, and the environmental guidance provided within it for compliance with all applicable environmental laws prior to promulgating any directive, all applicable environmental considerations are addressed appropriately in this Manual.

11. FORMS/REPORTS. The forms referenced in this Manual are available in USCG Electronic Forms on the Standard Workstation or on the Internet: http://www.uscg.mil/forms/; CG Portal https://cgportal.uscg.mil/delivery/Satellite/CG611/FORMS and Intranet at http://cgweb.comdt.uscg.mil/CGForms.

C. B. THOMAS /s/
Rear Admiral, U.S. Coast Guard
Assistant Commandant for Response Policy

RECORD OF CHANGES

Change Number	Date of Change	Date Entered	Entered By:

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REFERENCES

(a) United States National Search and Rescue Supplement to the International Aeronautical and Maritime Search and Rescue Manual
(b) International Aeronautical and Maritime Search and Rescue Manual (IAMSAR Manual)
(c) Coast Guard Incident Management Handbook, COMDTPUB P3120.17 (series)
(d) Coast Guard Incident Command System Implementation Plan, COMDTINST M3120.15 (series)
(e) Auxiliary Operations Policy Manual, COMDTINST M16798.3 (series)
(f) U.S. Coast Guard Command Center Manual (CCM), COMDTINST M3120.20 (series)
(g) Boat Crew Seamanship Manual, COMDTINST M16114.5 (series)
(h) Team Coordination Training, COMDTINST 1541.1 (series)
(i) Operational Risk Management, COMDTINST 3500.3 (series)
(j) Public Affairs Manual, COMDTINST M5728.2 (series)
(k) The Coast Guard Freedom of Information and Privacy Acts Manual, COMDTINST M5260.3 (series)
(l) Federal/State Relations – Recreational Boating Safety, COMDTINST 16750.8 (series)
(m) Memoranda of Understanding /Agreement, COMDTINST 5216.18 (series)
(n) Management and Operation of the Automated Mutual Vessel Rescue (AMVER) System, COMDTINST 16122.2 (series)
(o) U.S. Coast Guard Maritime Law Enforcement Manual (MLEM), COMDTINST M16247.1 (series)
(p) Telecommunication Manual, COMDTINST M2000.3 (series)
(q) Spectrum Management Policy and Procedures, COMDTINST M2400.1 (series)
(r) International SafetyNET Manual, IMO Publication
(s) Radiotelephone Handbook, CGTTP 06-01.1 (series)
(t) USMCC National Rescue Coordination Center and Search and Rescue Point of Contact Alert and Support Messages
(u) HQ USAF Operations Order 68-80; Busy Playmate – Search and Rescue; (HQ USAF msg 201330Z JAN 88; To obtain a copy of this reference please contact Commandant (CG-SAR))
(v) Emergency Medical Services Manual, COMDTINST 16135.4 (series)
(w) Critical Incident Communications, COMDTINST 3100.8 (series)
(x) Information and Life Cycle Management Manual, COMDTINST M5212.12 (series)
(y) Marine Safety Manual, Vol. VI, Ports and Waterways Activities, COMDTINST M16000.11 (series)
(z) Supply Policy and Procedures Manual (SPPM), COMDTINST M4400.19 (series)
(aa) Prevention of BloodBorne Pathogen Transmission, COMDTINST M6220.8 (series)
(bb) Federal Highway Safety Act of 1966
(cc) Boarding Officer Job Aid Kit (BOJAK)
(dd) United States Coast Guard Regulations 1992, COMDTINST M5000.3 (series)
(ee) 47’ Motor Life Boat Operator’s Handbook, COMDTINST M16114.25 (series)
(ff) 41’ UTB Operator’s Handbook, COMDTINST M16114.2 (series)
(gg) Rescue and Survival Systems Manual, COMDTINST M10470.10 (series)
(hh) Coast Guard Air Operations Manual, COMDTINST M3710.1 (series)
(ii) 30’ SRB Operator’s Handbook, COMDTINST M16114.15 (series)
(jj) Coast Guard Helicopter Rescue Swimmer Manual, COMDTINST M3710.4 (series)

(kk) Cutter Surface Swimmer Program, COMDTINST 16134.2 (series)
(ll) Coast Guard Diving Policies & Procedures Manual, Volume I, COMDTINST M3150.1 (series)
(mm) NAVSEA SUBMISS/SUBSUNK Bill for Submarines and Manned Noncombatant Submersibles, NAVSEAINST 4740.1 (series)
(nn) Contingency Preparedness Planning Manual, Volume III – Exercises, COMDTINST M3010.13 (series)
(oo) Privacy Incident Response, Notification and Reporting Procedures for Personally Identifiable Information (PII), COMDTINST M5260.5 (series)

LIST OF FIGURES

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NOTES TO READERS

NOTE 1: Policy and Doctrine

The hallmark of policy is the use of the terms "must" and "shall." These are mandatory terms. They require compliance or action. The term "prescribe" encompasses the term "restricts." Thus, other hallmarks of policy are the terms "must not" and "shall not."

By comparison, the hallmark of doctrine is the use of the terms "can" and "may." These are permissive terms. The term "should" is a mandatory term **unless justifiable reason** exists for not complying. Since there is a significant degree of judgment included within its use, the term "should" is more associated with doctrine than policy.

The term "will" is sometimes used in the place of "shall." This is incorrect in the context of both doctrine and policy. "Will" applies only to a statement of future condition and should not be used in the place of "shall."

Source: Doctrine Study Group Final Report, 01 April 2009

NOTE 2: Use of *Bold/Italic*

Items highlighted by ***bold/italic*** text are policy. This marking is based on the use of the terms "shall" and "must" (this includes, of course, "shall not" and "must not"). However, this marking is not all inclusive; some items constitute policy but do not currently use the terms "shall" or "must." Future changes will address highlighting of all policy statements.

ABBREVIATIONS AND ACRONYMS

(Note: Since some terms have more than one meaning, the reader is advised to carefully note the context in which an abbreviation or acronym is used.)

A	search area
A/C	aircraft
A/S	air station
ABC	airway, breathing, circulation
ACC	area control center
ACO	aircraft coordinator
ADCON	Administrative Control
ADF	automatic direction finding
AE	assistance entry
AFTN	aeronautical fixed telecommunications network
AICD	Automated Implanted Cardioverter Defibrillator
AIS	automatic identification system
AIS-SART	automatic identification system-search and rescue transponder
AM	amplitude modulation
AMS	aeronautical mobile service
Amver	Automated Mutual-assistance Vessel Rescue
ANB	55 foot Aids to Navigation Boat
AOI	Area of Interest
AOR	Area of Responsibility
ARTCC	air route traffic control center
ATC	air traffic control
ATN	aeronautical telecommunications network
ATON	Aids to Navigation
B	cross-over barrier pattern
BARD	Boating Accident Report Database
BC	bottom current
BOJAK	Boarding Officer Job Aid Kit
BSW	Base Sweep Widths
BUSL	49 foot Stern Loading Buoy Boat
C	coverage factor
C	creeping line pattern
C3CEN	Command, Control and Communications Engineering Center
CASP	Computer-Assisted Search Planning
CASPER	Contact Area Summary Position Report
CBT	Computer Based Training
CC	command center
CCIR	International Radio Consultative Committee
CPPM	Contingency Preparedness Planning Manual
CDO	Command Duty Officer
CES	coast earth station
CESM	Coldwater Exposure Survival Model
CG	Coast Guard
CGADD	Coast Guard Addendum
CIRM	Centro Internazionale Radio-Medico
CMF	Common Mapping Framework
COI	Certificate of Inspection
COMDTINST	Commandant Instruction
COMMSTA	Communications Station
COMSAR	Committee on Radiocommunications and Search and Rescue
Cospas	Cosmicheskaya Sistyema Poiska Avariynych Sudov (Russian language for “Space System for Search of Vessels in Distress”)
COTHEN	Customs Over The Horizon Enforcement Network
COTP	captain of the port
CPA	closest point of approach

CPB	Coastal Patrol Boat (Marine Protector Class)
CPR	cardiopulmonary resuscitation
CPS	Contingency Preparedness System
CPX	Command Post Exercise
CS	Cutter Swimmer
CS	creeping line single-unit
CSC	creeping line single-unit coordinated
CSP	Communications Service Provider
CSP	commence search point
CST	Commence Search Time
CUC	communications unit controller
DAN	Diver's Alert Network
DF	direction finding
DINFOS	Defense Information School
DMB	datum marker buoy
DME	distance measuring equipment
DOD	Department of Defense
DOS	Department of State
DR	dead reckoning
DR	disaster response
DRe	dead reckoning error
DSC	digital selective calling
DSN	defense switched network
DTG	date-time group
DVL	Digital Voice Logger
E	total probable error of position
EDS	Environmental Data Server
EGC	enhanced group calling
ELT	emergency locator transmitter
EMS	emergency medical services
EMT	emergency medical technician
EPIRB	emergency position-indicating radio beacon
EST	End Search Time
ETA	estimated time of arrival
ETD	estimated time of departure
EXCOM	extended communication search
F	flare patterns
F/V	fishing vessel
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FLAR	forward-looking airborne radar
FLIR	forward-looking infrared
FM	flare multiunit
FM	frequency modulation
FOIA	Freedom of Information Act
FOV	field of view
FS	flare single-unit
FSP	Foreign Service Post
FTX	Field Exercise
Fv	aircraft speed correction factor
f_W	weather correction factor
GEO	Geo-stationary Satellite
GHz	gigahertz
GIS	Geographic Information System
GMDSS	Global Maritime Distress and Safety System
GPS	global positioning system
H	homing pattern
HF	high frequency
HMN	Homing Multi-Unit Non-Return
HQ	headquarters
HS	homing single-unit
HSA	Homing Single Unit Aural
HSM	Homing Single Unit Meter
IAMSAR	International Aeronautical and Maritime Search and Rescue
IC	Incident Commander
ICAO	International Civil Aviation Organization
ICS	incident command system
IHO	International Hydrographic Organization
IIP	International Ice Patrol
IMA	Incident Management Activity

IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organization
Inmarsat	International Mobile Satellite Organization
INS	inertial navigation system
INTERCO	International Code of Signals
ISARC	Improvements to Search and Rescue Capabilities
ITU	International Telecommunication Union
JAWS / C2PC	Joint Automated Work Sheets / Command and Control Personal Computer
JRCC	joint (aeronautical and maritime) rescue coordination center
JRSC	joint rescue sub-center
kHz	kilohertz
km	kilometers
kt	knot (nautical miles per hour)
LC	lake current
LEO	Low, Near Polar Orbit
LKP	last known position
LOB	Line of Bearing
LPD	Letter of Presumed Death
LRS	Long Range Search
LUF	Lives Unaccounted For
LUT	local user terminal
LW	leeway
m	meters
M/V	merchant vessel
MARS	Maritime Mobile Access and Retrieval System
MAST	Military Assistance to Safety and Traffic
MCC	mission control center
MEDEVAC	medical evacuation
MEDICO	medical advice, usually by radio
MERTS	MISLE Enhancement Request Tracking System
MF	medium frequency
MFAG	Medical First Aid Guide
MHz	megahertz
MISLE	Marine Information for Safety and Law Enforcement
MLB	Motor Life Boat
MLB	Motor Life Boat
MLEM	Maritime Law Enforcement Manual
MMSI	maritime mobile service identity
MNPS	Minimum Navigation Performance Specification
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MRCC	Maritime Rescue Coordination Center
MRS	Medium Range Search
MSAP	Maritime SAR Assistance Policy
MSC	Maritime Safety Committee
MSI	maritime safety information
MSO	Marine Safety Office
n	number of required track spacings
NAVAREA	Navigational Area
NAVSAT	navigation satellite
NAVSEA	Naval Sea Systems Command
NAVTEX	Navigational Telex
NDRS	National Distress and Response System
NIIMS	National Interagency Incident Management System
NIMA	National Imagery and Mapping Agency
NM	nautical mile
NMCC	National Military Command Center
NOAA	National Oceanic and Atmospheric Administration
NOCR	Notification of Country of Registry
NOK	Next of Kin

NSARC	National Search and Rescue Committee
NSB	Non-Standard Boat
NSP	National Search and Rescue Plan
NSS	National Search and Rescue Supplement
NVG	night vision goggles
NWS	National Weather Service
O	contour pattern
O/B	outboard
O/O	Office of Operations
O/S	on-scene
OCMI	Officer in Charge, Marine Inspection
OFA	Oceanographic Features Analysis
OM	contour multiunit
OOD	Officer of the Deck / Day
OPC	Ocean Products Center
OPCON	Operational Control
OPFAC	Operational Facility
OS	contour single-unit
OSC	on-scene coordinator
OSC	Coast Guard Operations Systems Center
P	parallel pattern
P/C	pleasure craft
PBX	private branch exchange
Pd	drift compensated parallelogram pattern
PFD	personal flotation device
PIW	person in water
PLB	personal locator beacon
PM	parallel track multiunit
PMC	parallel multiunit circle
PMN	parallel track multiunit non-return
PMR	parallel track multiunit return
POB	persons on board
POC	probability of containment
POD	probability of detection
POS	probability of success
PQS	Personal Qualification Standard
PRECOM	preliminary communication search
PS	parallel track single-unit
PSAP	Public Service Answering Point
PSDA	Probability of Survival Decision Aid
PSS	parallel single-unit spiral
R	search radius
R&D	research and development
RAE	Right of Assistance Entry
RB-HS	Response Boat – Homeland Security
RB-M	Response Boat (Medium)
RB-S	Response Boat (Small)
RC	river current
RCC	rescue coordination center
RDF	radio direction finder
RDP	Remote Desktop Protocol
RF	radio frequency
RFF	Remote Fixed Facility
RNAV	Area Navigation (ICAO term)
RS	Rescue Swimmer
RSC	rescue sub-center
S	square pattern
S	track spacing
S/V	sailing vessel
SAP	Search Action Plan
SAR	search and rescue
SAREX	Search and Rescue Exercise
SARFAC	Search and Rescue Facilities
SARMIS	Search and Rescue Management Information System
SAROPS	Search and Rescue Optimal Planning System
SARS	Severe Acute Respiratory Syndrome
SARSAT	Search and Rescue Satellite Aided Tracking
SART	search and rescue radar transponder

SATCOM	satellite communications
SC	SAR coordinator
SC	sea current
SCC	Sector Command Centers
SES	ship earth station
SITOR	simplex telex over radio
SITREP	situation report
SLAR	side-looking airborne radar
SLDMB	Self Locating Datum Marker Buoy
SM	Searchmaster (Canadian term)
SMC	SAR mission coordinator
SNO	Statement of No Objection
SOLAS	Safety of Life at Sea
SPC (HWX)	Special Purpose Craft for Heavy Weather
SPPM	Supply Policy and Procedures Manual
SRR	Short Range Recovery
SRR	search and rescue region
SRS	search and rescue sub-region
SRU	search and rescue unit
SS	expanding square search
SSAS	Ship Security Alert System
SSB	single side band
SSTA	Sea Surface Thermal Analysis
SUC	surf current
SURPIC	surface picture
SVR	surface vessel radar
SWC	swell/wave current
T	search time available
T	true course
T	trackline pattern
TACAN	Tactical Air Navigation
TACON	Tactical Control
TAD	Temporarily Assigned Duty
TC	tidal current
TCM	Telecommunications Manual
TISCOM	Telecommunications and Information Systems Command
TLX	teletype
TMN	trackline multiunit non-return
TMR	trackline multiunit return
TMT	Training Management Tool
TQC	Training Quota Management Center
TSN	trackline single-unit non-return
TSR	trackline single-unit return
TTX	Table Top Exercise
TWC	total water current
UHF	ultra high frequency
UMIB	urgent marine information broadcast
USC	United States Code
USCG	United States Coast Guard
USDAO	U.S. Defense Attache Office
USMCC	United States Mission Control Center
USN	United States Navy
UTB	Utility Boat
UTC	coordinated universal time
v	speed of search object
V	SAR facility ground speed
V	sector pattern
VDSD	visual distress signaling device
VHF	very high frequency
VM	Sector Search Pattern Victor Mike
VMS	Vessel Monitoring System
VOR	Very High Frequency omnidirectional radio range
VS	sector single-unit
VSR	sector single-unit radar
w	search sub-area width
W	sweep width
WAGB	Icebreaker
WC	wind current
WHEC	Coast Guard High-Endurance cutter
WHO	World Health Organization
WLB	225 foot Coast Guard Buoy Tender
WLI and WLIC	65 foot and 100 foot Inland Buoy Tender (WLI) and 75 foot, 100 foot, 160 foot Inland Construction Tender (WLIC)

WLM	175 foot Coast Guard Buoy Tender	WTGB	Tugs
WLR	River Tender (65 foot and 75 foot)	X	initial (distressed craft) position error
WMEC	Coast Guard Medium-Endurance cutter	XSB	barrier single unit
WMO	World Meteorological Organization	Y	SAR facility position error
WPB	Coast Guard patrol boat	Z	effort
WTGB	140 foot Ice Breaking Tug		
WYTL	65 foot Harbor Tug		

PREFACE & PROGRAM OVERVIEW

1. **Mission and Purpose**

The mission and purpose of the Coast Guard's Search and Rescue (SAR) Program is to prevent death or injury to persons and loss or damage to property in the marine environment. The overall success of the Coast Guard's SAR program depends on many separate efforts, including SAR program management (doctrine, policy and procedures), facility management (platforms and units), support management (equipment, systems), training (proficiency), boating safety and marine inspection (prevention), and others. Ultimately, the success of our SAR program is measured by the success of each and every SAR mission that we perform. The focus of this addendum is on the four key processes involved in performance of our SAR missions: (1) distress monitoring and communications; (2) search planning; (3) search coordination; (4) search and rescue operations. The addendum also addresses SAR records and administration, public affairs, SAR liaison and agreements, SAR exercises, and several other aspects of our SAR mission.

2. **Risk Management**

We do dangerous work in a perilous environment. Our heritage is based in large part on the selfless acts of courageous men and women who use their tools and their judgment under the most demanding conditions to save the lives of others. This tradition continues as we perform duties that often place us in harm's way. With a renewed commitment to careful risk management, we seek to avoid jeopardizing the success of our missions by not unnecessarily endangering the lives of our own crews and the lives of those we go out to save. Successful missions begin with thoroughly understanding the environment in which we operate. Based on that understanding, we develop operational concepts, acquire appropriate equipment, and put our people through rigorous formal training. We build on that foundation by continuous operational training and drills, by improving our personal skills, and by maintaining our equipment at the highest state of readiness. In short, successful performance requires thorough preparation.

Preparation alone, however, is not enough. Success also requires that our people and equipment be used within the limits of their abilities. No small boat or aircraft, no matter how well maintained or skillfully piloted, can be expected to survive, much less perform a rescue, when wind and sea conditions are beyond the limitations of hull, airframe or the humans that operate them. Responsible commanders evaluate the capability of crew and equipment against the conditions likely to be encountered when deciding on the proper course of action. Conscious attention to time-tested and time-honored principles of risk management is a necessity.

Today's Coast Guard standard of response remains true to its legacy. We honor our heritage daily by casting off all lines or lifting off the runway in severe weather to save others' lives, while carefully weighing the risk of losing our own. We honor our heritage as well by attending to the principle that a proper and practiced understanding of duties, a thorough evaluation of the risks involved in an operation, and the exercise of good judgment in carrying out that operation is of paramount importance for success. With this in mind, Coast Guard units will carry out SAR missions only after the operational commander has ensured the unit is properly trained, equipped, maintained and ready for the mission and has assessed crew and equipment capabilities and limitations against the operational scenario and the known and predicted challenges the crew will face. Amplified discussion of SAR risk assessment is contained in Section 1.2.3 of this

Addendum.

3. **SAR Functions and Hierarchy**

   a. **Search:** An operation normally coordinated by a rescue coordination center (RCC), rescue sub-center (RSC), or a sector command center, using available and appropriate personnel, facilities and resources to locate persons or property in distress.

   b. **Rescue:** An operation with the primary purpose of retrieving persons in distress and delivering them to a place of safety. This may include providing for certain medical care or other critical needs. Rescue operations may also be performed for the purpose of preventing or mitigating property loss or damage. ***However, missions shall not normally be performed for the purpose of salvage or recovery of property when those actions are not essential to the saving of life.*** Beneficial secondary consequences of a rescue operation may be to prevent environmental damage or remove hazards to navigation, but these are not considered part of the rescue operation's objective.

   c. The rescue of persons in distress is the highest priority SAR mission. Missions solely for saving property or for other purposes such as preventing environmental damage will always give way to saving a person's life.

4. **Statutory Authority and Responsibility**

   The statutory authority for the U. S. Coast Guard to conduct SAR missions is contained in Title 14, Sections 2, 88, and 141 of the U.S. Code. ***The code states that the Coast Guard shall develop, establish, maintain and operate SAR facilities and may render aid to distressed persons and protect and save property on and under the high seas and waters subject to the jurisdiction of the United States.*** It also states that the Coast Guard **may** use its resources to assist other Federal and State entities. Thus, Coast Guard performance of SAR is essentially permissive in nature. Search and Rescue activity may be considered a mandated function, but no specific level of performance has been cited under the legislative authority. ***Nevertheless, judicial rulings have made it clear that once the Coast Guard undertakes a particular mission, we must conduct that mission with due diligence, we must not worsen a situation by our actions, and we must meet a reasonable standard of performance.*** Moreover, it is within our service's own ethos to carry out each mission to the best of our ability.

   In accordance with the National Search and Rescue Plan, the Coast Guard is responsible for organizing available SAR facilities in Search and Rescue Regions (SRRs) as defined in the National SAR Supplement. These waters generally include all navigable waters subject to the jurisdiction of the United States, but also include international waters stretching far into the Atlantic and Pacific Oceans and the Gulf of Mexico.

5. **SAR Publications**

   a. **Description.** SAR doctrine, policy and procedures for the Coast Guard are provided in three primary publications. These publications provide material that applies to each of three levels (international, national & agency) within our SAR system. Each publication both complements and supplements the others.

      (1) The **National Search and Rescue Plan** is a federal executive level inter-agency document that describes how the United States will meet its international legal and humanitarian

obligations to provide SAR services. It establishes over-arching federal SAR policy, assigns SAR responsibilities to various federal agencies, and adopts the International Aeronautical Search and Rescue Manual and the National SAR Supplement for use by U. S. SAR agencies.

(2) The **International Aeronautical and Maritime Search and Rescue (IAMSAR) Manua**l, in three volumes, provides doctrine applicable on an international level. Volumes I and II of the manual describe the basic structure of the SAR system and address the fundamentals of the four basic processes listed in Section 1 of this preface: SAR communications, planning, coordination and operations. Volume III is designed for use by SAR facilities and by units or individuals in need of SAR services. Not all Coast Guard commands require the full three-volume set. In general, SAR Coordinator (SC) commands will require all three volumes, commands with personnel who may be designated as SAR Mission Coordinators (SMC) should have volumes II and III, and response units may need only volume III.

(3) The **United States National Search and Rescue Supplement (NSS) to the IAMSAR Manual** provides the inter-agency doctrine applicable at the federal level. This Addendum defines the national SAR system, expands on topics covered by the IAMSAR Manual, and provides specific guidance for coordination and operations unique to the United States.

(4) The **Coast Guard Addendum (CGADD) to the NSS** provides policies, procedures, and standards applicable specifically to the U. S. Coast Guard. The CGADD serves as the standard reference for the entire Coast Guard to use in performance of our SAR missions: (1) distress monitoring and communications; (2) search planning; (3) search coordination; (4) search and rescue operations. Further, it provides a common reference for discussion among Coast Guard SAR professionals and a timely mechanism for recommending and implementing improvements to the SAR system. Just as SAR is not the only mission conducted by our Joint Rescue Coordination Centers (JRCCs), Sectors, air stations and boat stations, the SAR Program functions as part of the larger Coast Guard, and has developed our SAR doctrine as part of both the larger national and international maritime and aeronautical SAR networks. The CGADD addresses this organizational relationship and focuses on the particulars of search planning and response.

(5) Several additional Coast Guard and other publications provide policy, procedures and guidance that apply to SAR, and serve to enhance the overall professional knowledge of SAR personnel. A list of some of these publications is found in Appendix K.

b. **Precedence.** Each successive level of primary SAR publications, from the National SAR Plan to the CGADD, provides greater refinement of doctrine, policy and procedure. ***If conflicts arise between guidance or information in the various publications, Coast Guard SAR personnel shall follow the CG Addendum, unless otherwise directed by COMDT (CG-SAR).***

6. **SAR Program Goals, Objectives, Standards and Requirements**:

a. **SAR Program Primary Goal.** The ultimate **goal** of the Coast Guard's SAR program is to prevent loss of life in every situation where our actions and performance could possibly be brought to bear. Our success in meeting this goal is the result not only of how well the SAR system responds to maritime SAR incidents, but also the efforts of other maritime safety programs, including recreational boating safety and commercial vessel safety. Success reflects

how these combined efforts provide mariners with seaworthy craft, proper equipment, necessary knowledge, training, and information to operate safely in the maritime environment, and to take the correct actions when faced with a distress situation.

b. **Program Objectives.** Four general objectives provide direction for the SAR Program:

(1) Minimize loss of life, injury, and property loss and damage in the maritime environment;

(2) Minimize crew risk during SAR missions;

(3) Optimize use of resources in conducting SAR; and

(4) Maintain a world leadership position in maritime SAR.

c. **SAR System Performance Benchmark.** From a humanitarian perspective we would like to prevent all loss of life at sea. We recognize, however, the inherent danger involved in the maritime environment makes this unattainable. The current performance **benchmark** for our maritime safety mission strives to measure the effectiveness of our collective prevention and response efforts. Simply stated it measures the number of "lives saved" versus the number of "lives in distress." "Lives in distress" as used in this measure refers to persons in peril caused by some extraordinary event (e.g. injury, material failure of the vessel, environmental conditions, etc.). When a life is in distress there are three possible outcomes – the life is saved, the life is lost, or a person remains missing at the conclusion of search efforts. The "lives lost" portion of the measure recognizes that some of those lives will be lost before the Coast Guard is notified or has any chance to affect the outcome. Therefore "lives lost" is further divided into "lives lost before notification" and "lives lost after notification." The persons missing are not divided into "before" and "after." All are accounted for within the purposes of the primary lives saved performance measurement: "Percent of lives saved from imminent danger in the maritime environment." This primary measure encompasses the effectiveness of the total search and rescue system, response and prevention activities. To calculate this measure we use the equation:

$$= \frac{LS}{\left(LS + \left(LLB + LLA + LUF\right)\right)}$$

Where:
LS = "lives saved"
LLB = "lives lost before notification"
LLA = "lives lost after notification" and
LUF = "lives unaccounted for" (or missing) as defined and input into MISLE.

(1) Our performance benchmark target is based on calculations of historical performance and estimations of attainable levels of success. As future improvements are made in the SAR System we expect these improvements to be reflected in our performance as shown below with planned periodic adjustments to the benchmark.

Lives Saved Performance Target	*Save people in imminent danger on the ocean and other waterways.*					
Performance Measure		FY11	FY12	FY13	FY14	FY15
Percent of people in imminent danger saved in the maritime environment.	Program Target	*77%*	*77%*	*77%*	*77%*	*77%*
	FYHSP Target	*100%*	*100%*	*100%*	*100%*	*100%*

(2) A specific benchmark has been established to measure a subset of the overall Coast Guard Maritime Safety of Lives. This sub-measure encompasses primarily the response activities of the service's maritime safety team. This indicates how well we are performing within the constraints of our current resources. After Coast Guard notification, in waters over which the Coast Guard has SAR responsibility save a targeted percentage of those people whose lives are in distress each year as detailed in the following table. As improvements are made in the SAR System, we expect these improvements to be reflected in our response performance as shown below with planned periodic adjustments to the benchmark.

Lives Saved Performance Target	*Save people in imminent danger on the ocean and other waterways.*					
Performance Measure		FY11	FY12	FY13	FY14	FY15
All mariners in distress saved after CG has been notified	Program Target	*84%*	*84%*	*84%*	*85%*	*85%*
	FYHSP Target	*100%*	*100%*	*100%*	*100%*	*100%*

To calculate this measure we use the equation:

$$= \frac{LS}{LS + LLA + LUF}$$

Where:
LS = "lives saved"
LLA = "lives lost after notification" and
LUF = "lives unaccounted for" as defined and input into MISLE.

NOTE: These benchmarks were established based on a macro analysis of expected survival times of people in the water and based on an excellent standard of response by existing rescue resources under the current SAR system. It is recognized that regional variances (cold water versus warm, resource-rich port area versus remote locations) will impact the success rate in specific regions.

(2) A specific benchmark has been established to measure a secondary measure of the SAR Systems performance in service to property in danger in the maritime environment. That benchmark is to save a targeted percentage of property in distress each year. As improvements are made in the SAR System, we expect these improvements to be reflected in our response performance with planned periodic adjustments to the benchmark. The benchmark baseline was set using fiscal years 2009 and 2010 data.

Property Saved Performance Target	*Save property in danger of loss on the ocean and other waterways.*					
Performance Measure		FY11	FY12	FY13	FY14	FY15
Percent of property "in danger of loss" saved.	Program Target	*70%*	*70%*	*71%*	*71%*	*71%*
	FYHSP Target	*70%*	*70%*	*71%*	*71%*	*71%*

To calculate this measure we use the equation:

$$= \frac{PS}{PS + PL + PUF}$$

Where:
PS = "property saved"
PL = "property lost" and
PUF = "property unaccounted for" as defined and input into MISLE.

d. **Data Exclusions from SAR System Performance Benchmark Measurement.** The SAR System Benchmarks are primarily in place to measure long term trends in SAR system performance. To avoid undue influence on the measures by a small number of events involving large numbers of lives, the data associated with these events is excluded from calculation of the measure(s). Although not included in measure calculations, they are footnoted in reports. The thresholds for exclusion are:

(1) **Lives** – 11 or more lives at risk (lives saved, lost and/or unaccounted for) in a single incident.

(2) **Property** – value in excess of $2M, lost in a single incident.

e. **General SAR Program Standards and Requirements.** Certain standards and requirements have been developed for various components of the Coast Guard's SAR system.

(1) **SAR Readiness.** The SAR unit response standard is geared toward quick response craft at boat and air stations. Readiness requirements for individual units are assigned by the District Commander in accordance with the general responsibilities for readiness and response for SAR incidents provided in the Coast Guard Organization Manual, COMDTINST M5400.7 (series), and United States Coast Guard Regulations, 1992,

COMDTINST M5000.3 (series). ***To meet the SAR response standard for most Coast Guard unit AORs, Coast Guard units with a SAR readiness responsibility shall maintain a B-0 (have a suitable SAR resource ready to proceed within 30 minutes of notification of a distress) readiness.*** This readiness requirement may be adjusted by District Commanders, and by unit commanders when this authority is delegated, based on resource constraints, crew fatigue limits, environmental considerations or other factors. This response standard is in no way intended to negate or supercede proper risk management. It is recognized that mechanical malfunction, unusual mission preparations or other factors may make it necessary to deviate from this standard. ***Such deviations shall be reported to the District Commander.*** In certain areas and/or at certain times of the year, the presence of unit coverage overlap may allow a lower readiness than B-0 (greater than 30 minutes).

(2) **SAR Mission Response.** Based on assigned SAR areas of responsibility (AOR) for Coast Guard Sectors and other Coast Guard units with specified SAR AORs, the siting, basing or staging of search and rescue units (SRU) should provide for no greater than a two-hour total response time for any one surface or air SRU within that Sector or unit's AOR to arrive at any location within the AOR. This time is calculated from time of notification of the Coast Guard until the time of arrival on scene of an SRU, based on moderate environmental conditions which allow for operation of the SRUs at their top cruise speeds, and including 30 minutes of preparation time (i.e. a total of 90 minutes from underway to on scene). This is a SAR system resource-planning standard; it does not create a requirement for SRUs to actually arrive on scene within this time in each and every case, as the particular circumstances of any given mission may make this impossible or contrary to proper risk assessment. It is recognized that this response standard may not be met in the AORs of all Coast Guard units with SAR responsibility, especially in those which include vast areas of open ocean and/or remote areas with little or no SAR demand.

NOTE: Search and Rescue Regions (SRRs) associated with Rescue Coordination Centers (RCCs) are determined by international agreement, and are not strictly based on Coast Guard readiness and response standards. RCCs are nevertheless responsible for directing and coordinating response to SAR incidents, within their SRRs, by dispatching the most suitable assets in the timeliest manner possible. Likewise, the Coast Guard's SAR program is responsible for providing suitable assets in the proper locations to provide SAR capability throughout as much of our SRRs as possible.

(3) **National Distress and Response System (NDRS) Coverage.** NDRS is the primary distress alerting and SAR command, control and communications (C3) system for U.S. coastal waters (Sea Area A-1, which extends from the territorial baseline out to 20 nautical miles). The standard for the VHF-FM network is a minimum 90% continuous coverage for reception of a one-watt signal of a one-meter antenna, out to 20 nautical miles from shore around the coastline of the continental U.S., the Great Lakes, main Hawaiian Islands, the Commonwealths of Guam, Puerto Rico, the U.S. Virgin Islands and portions of Alaska.

(4) **Basic SAR Training.** Successful completion of resident SAR planner training at the National SAR School is required for all Area & District (Joint Rescue Coordination Center), and Sector Command Center watchstanders and staff who may be designated as SMC or perform SMC functions. Area/District (drm) and other SAR staff personnel should also attend the resident course on a lower priority basis. An additional goal is to

complete training in the Incident Command System (ICS) for all SAR planning personnel and SAR staffs.

(5) **SAR Command and Control Responsiveness.** ***SMCs shall process and evaluate information about a SAR incident, determine appropriate initial action, and initiate action within five minutes of a distress incident notification. Units other than that of the SMC receiving SAR incident information shall relay information to the SMC immediately.***

(6) **Employment of Approved Search Planning Methodologies.** ***Coast Guard SAR Watchstanders shall use an approved search-planning tool for all incidents that require search planning and fully document search planning efforts.*** Approved tools include the Search and Rescue Optimal Planning System (SAROPS) and the manual solution work sheets with manual plotting. (See Section 3.2)

(7) **Amver System.** ***SMCs shall use Amver to identify SAR facilities for all cases involving maritime and aeronautical incidents offshore when such facilities might be useful for mission accomplishment. SAR Coordinators (SC), SMCs, and others within the Coast Guard SAR System shall seek to increase ship participation in this voluntary ship reporting system for SAR and promote the use of Amver information for SAR purposes by other RCCs.***

(8) **SAR Unit Training and Professionalism.** ***The search and rescue unit (SRU) crew shall be able to correctly operate all equipment provided on their vessels, aircraft or land vehicles to aid a person or property in distress. Specialized and recurrent training shall be provided to personnel designated by the unit as Rescue Swimmers, Emergency Medical Technicians (EMTs), or First Responders. All personnel assigned these specialized rescue duties shall demonstrate a high level of professionalism and competency as documented by completion of appropriate PQS, practical factors, and by their performance.***

7. SAR Program Focus

The Coast Guard Headquarters Office of Search and Rescue, Commandant (CG-SAR) performs the functions of the SAR Program Manager. The SAR Program's overall purpose is to provide the resources and policy that facilitate Coast Guard field units in achieving optimal effectiveness in saving lives and property in distress or at risk of injury or damage. The program addresses known and latent deficiencies in the SAR system and strives for continuous improvement in Coast Guard SAR response capabilities through policy-making and budget actions. SAR Program efforts are focused in five key areas:

a. **SAR Policy:** adoption and development of IAMSAR Manual, National SAR Plan, National SAR Supplement, CG Addendum to the National SAR Supplement.

b. **SAR Professionalism:** update of SAR School curriculum (including CBT courses); renewed emphasis on SAR planning skills for JRCC, Rescue Sub-Center (RSC) and Sector Command Center planners; development of SAR PQS, SAR Standardization (Command Center Stan Team).

c. **SAR Capabilities:** development and acquisition of computer-assisted SAR planning and case management tools (SAROPS, MISLE (response module, SAR data entry, MMSI)) and other

operational equipment (self-locating datum marker buoys, Personal Locator Beacons (PLBs) for SAR crews, new SAR signaling and detection devices, etc.).

d. **SAR Communications:** SAR related comms procedures; comms systems improvements (National Distress and Response System Modernization Project (NDRSMP)/Rescue 21, and Global Maritime Distress and Safety System (GMDSS)).

e. **International SAR System:** cooperation in doctrine, standards, organization, coordination, and R&D.

8. SAR System Infrastructure:

The Coast Guard's SAR System infrastructure is composed of a network of Headquarters, Area, District and field commands:

a. **Headquarters offices** with key SAR program, resource and support responsibilities include: Office of SAR Policy (Commandant (CG-SAR)), Office of Shore Forces (Commandant (CG-741)) (serves as program manager for all CG command centers), Office of Boat Forces (Commandant (CG-731)), Office of Aviation Forces (Commandant (CG-711)), Office of Auxiliary and Boating Safety (Commandant (CG-BSX)), Office of C4 and Sensor Capabilities (Commandant (CG-761)); Office of Environmental Response Policy (Commandant (CG-MER)), and Office of Communications Systems (Commandant (CG-62)).

b. **Area and District staffs** include senior officers and key staff assigned specifically to oversee operational and programmatic SAR matters (Atlantic Area (Arm), Pacific Area (Prm) and District (drm)). The functions of SAR Coordinator (SC) are carried out at this organizational level. Depending on the nature, complexity, duration, geography, and resource requirements of a particular SAR case, SMC functions are sometimes carried out at this level in the Area or District's multi-mission Command Center, which is also and serves as an internationally recognized JRCC.

c. **Sectors are** multi-mission commands that are responsible for the full range of Coast Guard missions and operate a command center for that purpose. SMC functions are typically carried out at the Sector level for most SAR cases.

d. **Air Stations and Boat Stations are** units that perform specific assigned SAR missions as well as many other Coast Guard missions (LE, MEP, ATON, RBS, etc.). Over 1900 vessels (ships & boats) and over 200 aircraft (fixed wing and rotary wing) provide ready response around the nation.

e. **An extensive communications network** for distress alerting and response coordination, consisting of the National Distress and Response System (NDRS) VHF-FM sites and MF/HF sites serving SAR communications needs. The sites are operated by a combination of Sector communications centers and Communications Area Master Stations (CAMS), depending on the frequency band, location and other communications infrastructure considerations.

9. Terms within the Addendum.

The following terms found in the Addendum are discussed in terms of policy and doctrine in the Notes To Readers. They are provided here for easy reference. They have these intended meanings:

a. **"Shall"** and **"Must"** (also **"Shall Not"** & **"Must Not"**) are used to show an action, procedure

or application that is mandatory.

b. **"Should"** is used to show an action, procedure or application that is recommended and expected as the normal course of action, and is deemed mandatory **unless justifiable reason** exist for not complying.

c. **"May"** and **"Can"** are permissive and used to show when an action, procedure or application is optional.

d. **"Will"** is used only to indicate futurity, never to indicate any degree of requirement for action, procedure or application. It should not be used in the place of **"Shall."**

10. Applicability and Obligation

The policies and procedures in this Addendum apply to U. S. Coast Guard facilities within the U.S., territories, and possessions, and to U. S. Coast Guard SAR operations worldwide. This directive promulgates internal Coast Guard planning guidance solely intended to promote efficiency and consistency in public service above and beyond the requirements of law and regulation. Any obligations discussed, flow only to the Coast Guard. Coast Guard personnel are expected to exercise broad discretion and to exercise sound judgment in performing the functions discussed. The Coast Guard retains the discretion to deviate from or change this guidance without notice. This document is intended to provide policy for Coast Guard personnel and is not intended to nor does it impose legally-binding requirements on any party outside the Coast Guard.

This addendum represents internal policy guidance to Coast Guard units and is not intended to create any right or cause of action on behalf of the public.

CHAPTER 1
SEARCH AND RESCUE SYSTEM

Section 1.1
Search and Rescue (SAR) Organization

The National SAR Plan (Appendix A of Reference (a)), designates the Coast Guard as the aeronautical and maritime SAR Coordinator for the waters over which the United States has jurisdiction, such as navigable waters of the United States and land areas other than the Continental United States and Alaska (e.g. State of Hawaii). Reference (a) provides a chart showing the geographic areas of SAR responsibility and discussion on both international and domestic arrangements made to implement the United States SAR system.

1.1.1 Rescue Coordination Center

Rescue Coordination Center (RCC) is internationally recognized as the designation of a facility with the responsibility to promote efficient organization of SAR services and to coordinate the conduct of SAR operations within a search and rescue region (SRR). For the Coast Guard, this is one of the primary functions performed at the Area and District level command centers and includes all aeronautical and maritime incidents within its maritime SRR; the Coast Guard operates Joint Rescue Coordination Centers (JRCC) because of both aeronautical and maritime SAR responsibilities. Atlantic and Pacific Areas remain SAR Coordinators (SC) for the Atlantic/Pacific Ocean U.S. Aeronautical and Maritime SRRs respectively, but have no primary SRR responsibility. For internal purposes and ease of administration, the Coast Guard divides the U.S. SRRs into areas of responsibility, with each District maintaining primary responsibility in their assigned SRR.

Table 1-1 USCG SAR Coordinators, RCCs and Locations

SAR Coordinator Command / JRCCs	***Location***
Atlantic Area	Norfolk, Virginia
First District	Boston, Massachusetts
Fifth District	Norfolk, Virginia
Seventh District	Miami, Florida
Eighth District	New Orleans, Louisiana
Ninth District	Cleveland, Ohio
Pacific Area	Alameda, California
Eleventh District	Alameda, California
Thirteenth District	Seattle, Washington
Fourteenth District	Honolulu, Hawaii
Seventeenth District	Juneau, Alaska

1.1.2 Rescue Sub-Center

Rescue Sub-Center (RSC) is internationally recognized as the designation of a facility established where the RCC cannot exercise direct and effective control over SAR facilities in remote areas, or where local facilities can be directed only through local authorities. There are two RSCs in the Coast Guard; Sector San Juan within Seventh District (RSC San Juan under RCC Miami) and Sector Guam within Fourteenth District (RSC Guam under RCC Honolulu).

1.1.3 Sector Command Center

The Command Center at the Sector level is an internal Coast Guard designation. Sector Command Centers are subordinate to the RCCs. Sector Command Centers, while performing many of the SAR duties, are not designated as RCCs or RSCs. The Sector Command Center is responsible for SAR mission coordination and tactical control of search and rescue units (SRUs) in its AOR, which is within the SRR of the RCC.

1.1.4 Incident Command System and SAR

1.1.4.1 Background. SAR efforts primarily focus on finding and assisting persons in actual or apparent distress and are carried out within a well-defined SAR response system per References (a) and (b) and this Addendum. These references have their basis in international law and have practical benefits that are intended to maximize the effectiveness of SAR operations, particularly when working with other military services, SAR authorities of other nations, and with ships or aircraft at sea. U.S. SAR service providers are obligated to follow these laws.

When an emergency warrants responses in addition to SAR, the National Interagency Incident Management System (NIIMS) Incident Command System (ICS) organizational structure should be used to manage the overall response. Examples of other activities that are not SAR, but are often closely associated with a large SAR incident, include:

(a) search and recovery,

(b) salvage,

(c) investigation,

(d) fire fighting, and

(e) pollution response.

See Reference (c) for a detailed description of the ICS organizational structure that will provide supervision and control of essential functions during a major SAR incident that includes, or will include, other non-SAR activities.

1.1.4.2 ICS and SAR System Interface. For large incidents that actually or potentially involve both SAR and non-SAR activities, the SAR Mission Coordinator (SMC), who is designated by the SAR response system, will initiate action and coordinate the overall SAR aspect of the response in accordance with References (a), (b), and this Addendum.

If a Coast Guard Incident Commander (IC) is designated, the SMC function will be placed under the umbrella of the ICS organizational structure, typically as the SAR Branch Director or SAR Sector Supervisor in the Operations Section. Simply put, the SAR response system "plugs into" the ICS organizational structure, where the SMC (or someone designated by the SMC to carry out this function) serves as the "plug" or link. ***In essence, SAR personnel shall continue to use standard SAR terminology and procedures regardless of the scope of the SAR incident.***

The SAR response may also include an On Scene Coordinator (OSC) and an Aircraft Coordinator (ACO). In some cases the person serving as IC or Operations Section Chief in the ICS structure may also be designated as the SMC, but the terms "Incident Commander" or "Operations Section Chief" are not interchangeable with titles associated with SAR response functions.

1.1.4.3 Closing/suspending a SAR case in an ICS structure. Only agencies designated as U.S. SAR Coordinators (i.e. the USCG for maritime regions) have the authority to suspend a SAR case. For example, the NTSB does not have the authority to suspend a maritime SAR case even though they may fill the IC role. Per Reference (b), the IC may continue the SAR mission beyond the time when a SAR case would normally be suspended due to humanitarian considerations, large number of people involved, or forecast of greatly improved search conditions.

However, SRUs should not be placed at risk when potential for saving life is minimal, or when their use may preclude their availability for other missions. For the majority of incidents, the SAR response will be completed or suspended by the time the ICS structure is fully in place.

1.1.4.4 Transition from SAR to Other Missions. As the SAR mission winds down and other missions take precedence (i.e. search and recovery), the SMC may be designated to serve as a Branch Director or Section Supervisor in the Operations Section to manage on scene operations other than SAR. Likewise, Search and Rescue Units (SRUs) may also be reassigned to other sectors in the ICS structure once the SAR mission is concluded.

Coast Guard personnel with SAR responsibilities should receive required ICS training to enable them carry out their respective duties. See Reference (d) for minimum Coast Guard ICS training requirements.

Section 1.2
SAR Coordination

SAR coordination is discussed in the National Search and Rescue Plan contained in Reference (a). Coordinating SAR response to any distress situation will be achieved through cooperation among SAR authorities willing and able to assist. To achieve this, the Coast Guard may enter into international, domestic and local SAR agreements as discussed in Section 1.6

Any facility within a SAR organization should respond to distress situations whenever and wherever it is capable of doing so. SRRs are established to help ensure response to persons in distress will be coordinated, and should in no way be viewed as justification for an RCC not assisting persons in distress outside its own SRR. Cooperation among Coast Guard RCCs and with SAR authorities of other countries should be as close as practicable, and arrangements to request or grant a request for assistance should normally be handled at the RCC level as expeditiously as possible. The general principle that applies is that the facilities that are in the best position to respond should be tasked. On an operational level, SAR response includes: investigation, coordination, and dissemination of information.

It is crucial that all levels of the SAR organization keep each other informed, both up and down the chain of command. This Addendum discusses required documentation but the SAR planner needs to anticipate when additional awareness of an incident may be required (e.g., expansion of case complexity or public interest). Prior sharing of information in such situations will decrease the chance that superiors might be caught uninformed and that SRUs might be unable to respond.

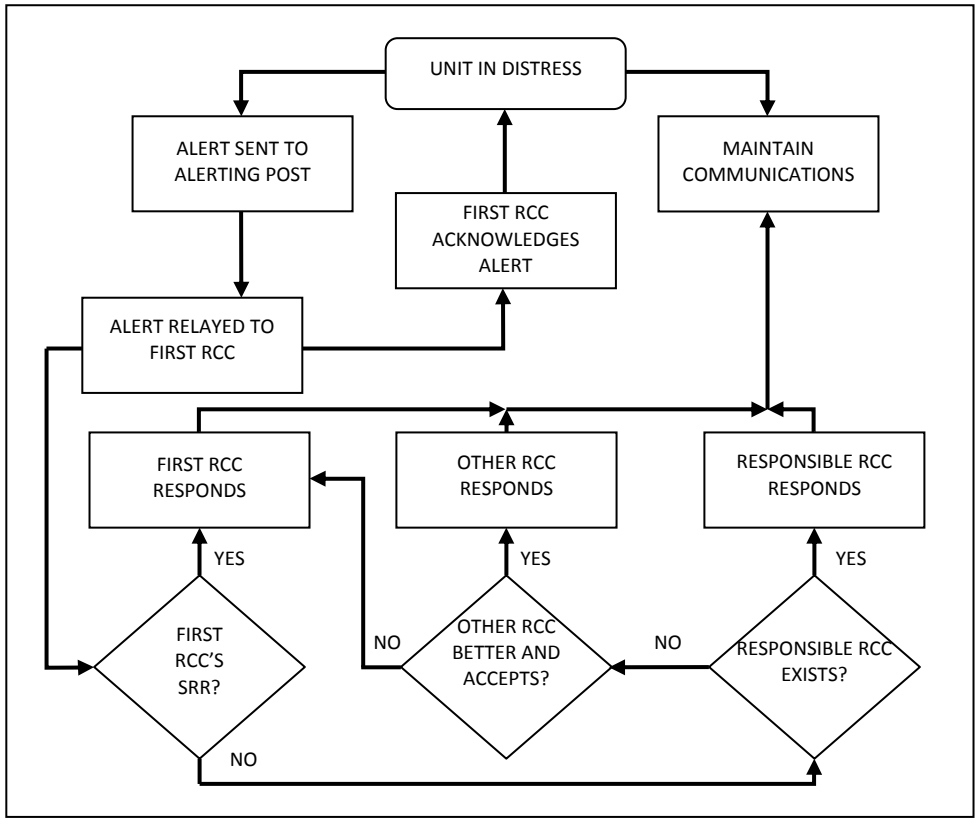


Figure 1-1 Determination of RCC to Respond

1.2.1 First RCC

Reference (a) outlines actions required by the "First RCC." The RCC affiliated with the unit which first acknowledges a distress alert is designated the First RCC and should assume responsibility for all subsequent coordination of SAR measures unless and until that responsibility is accepted by another RCC better suited to respond. Figure 1-1 summarizes the guidelines for the First RCC.

NOTE: First RCC retains responsibility until it is accepted by another RCC, and maintains communications with the unit in distress until the other RCC can do so.

1.2.2 SAR Mission Coordinator (SMC)

An SMC shall be designated for every SAR case to successfully manage each mission and to skillfully coordinate resources, in accordance with References (a) and (b).

1.2.2.1 SAR missions are normally coordinated at the lowest practicable level within an SRR for both efficiency and practicality reasons, but SMC responsibilities shall not be delegated below the Sector level.

1.2.2.2 The SMC within the Coast Guard operates within the SAR chain of command as the person assigned to carry out all aspects of planning, coordinating and managing the response to a SAR incident. The SMC must be assigned at the appropriate level within the SAR organization, so as to provide effective SAR incident oversight and supervision, as well as ensuring proper SAR mission execution. The SMC is required to have the requisite experience, knowledge, and skills to fully direct the command center in its efforts, ensure the appropriate response to each SAR incident, and evaluate the effectiveness of their actions. SMC carries out the functions with the support of the Command Center SAR watchstanders. As such, the command center is accountable for executing key elements of the initial response, providing accurate and timely products, and information that supports decision processes in SAR mission execution.

(a) At the District level, the SMC is the direct representative of the SAR Coordinator (SC). At the Sector level, the SMC is the direct representative of SC through the Sector Commander.

(b) Considerable authority is delegated to SMCs to ensure that lifesaving actions can be carried out in a timely and effective manner. The SMC should be able to employ or launch any asset assigned to the mission (tactical control) and request additional support as needed.

(c) Although the SMC is assigned on a mission-by-mission basis, commands should pre-designate a person to assume SMC at the initial report of a SAR incident, consistent with Section 1.2.2.6 and Table 1-2.

(d) ***SMC shall not be a member of the Command Center watch that is planning and executing a particular mission.*** This provides increased objective oversight and augments the technical SAR planning expertise of the command center with an additional layer of operational expertise.

(e) Some SMC tasks (i.e., SITREPs, MISLE data entries, initial response authority, etc.) may

be delegated to Sector units when they carry out single unit cases that do not require search-planning efforts. In these cases, the SMC at the Sector remains responsible for ensuring those functions are properly carried out. ***Once SAR response efforts exceed the initial response, the Sector shall assume all SMC tasks.***

(f) Figures 1-2 and 1-3 depict the typical SAR chain of command for SMC at the District and Sector level respectively.

(1) The figures depict the lowest level in the command that SMC may be assigned. SMC may be assigned to an individual at any level above that point in the chain of command, provided that the requirements are met as outlined in 1.2.2.3 and 1.3.

(2) The particulars of each SAR incident and established policies determine the degree of involvement (e.g. briefings, concurrence/approval of actions, etc.) up the SAR chain of command from the SMC.

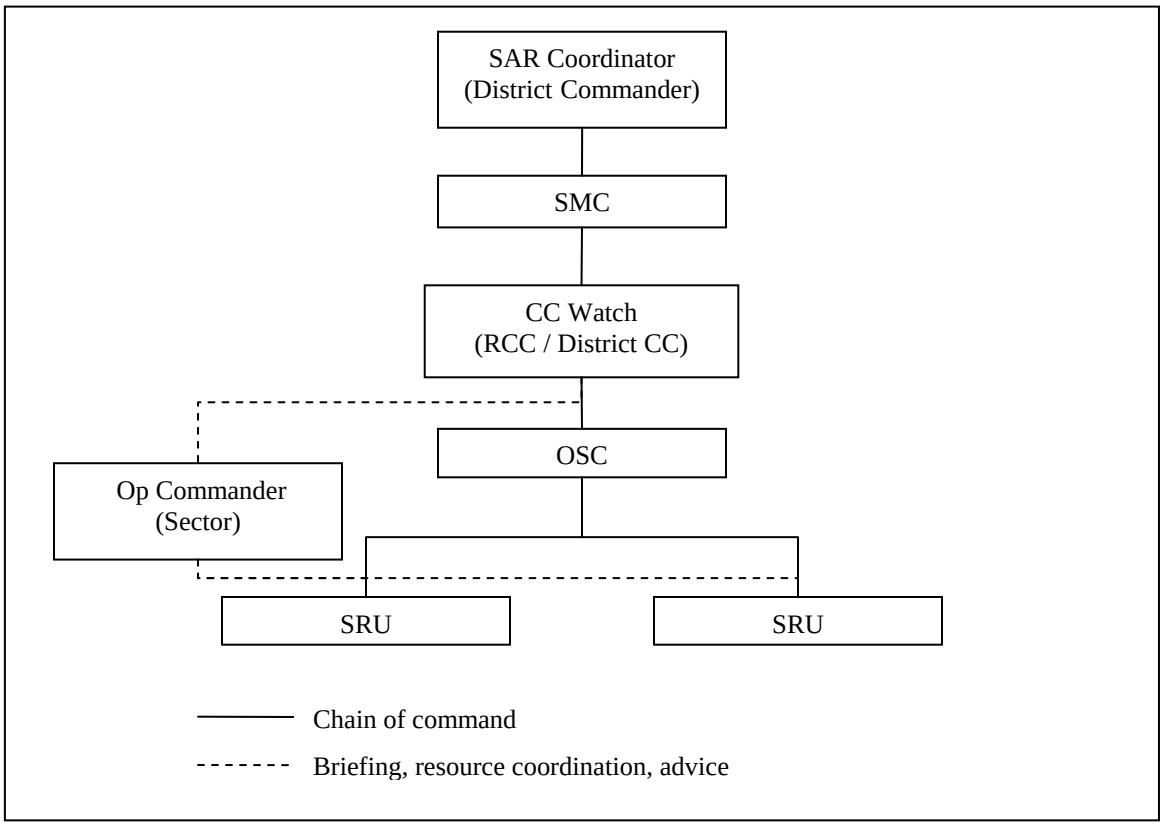


Figure 1-2 SAR Chain of Command for SMC at the District Level

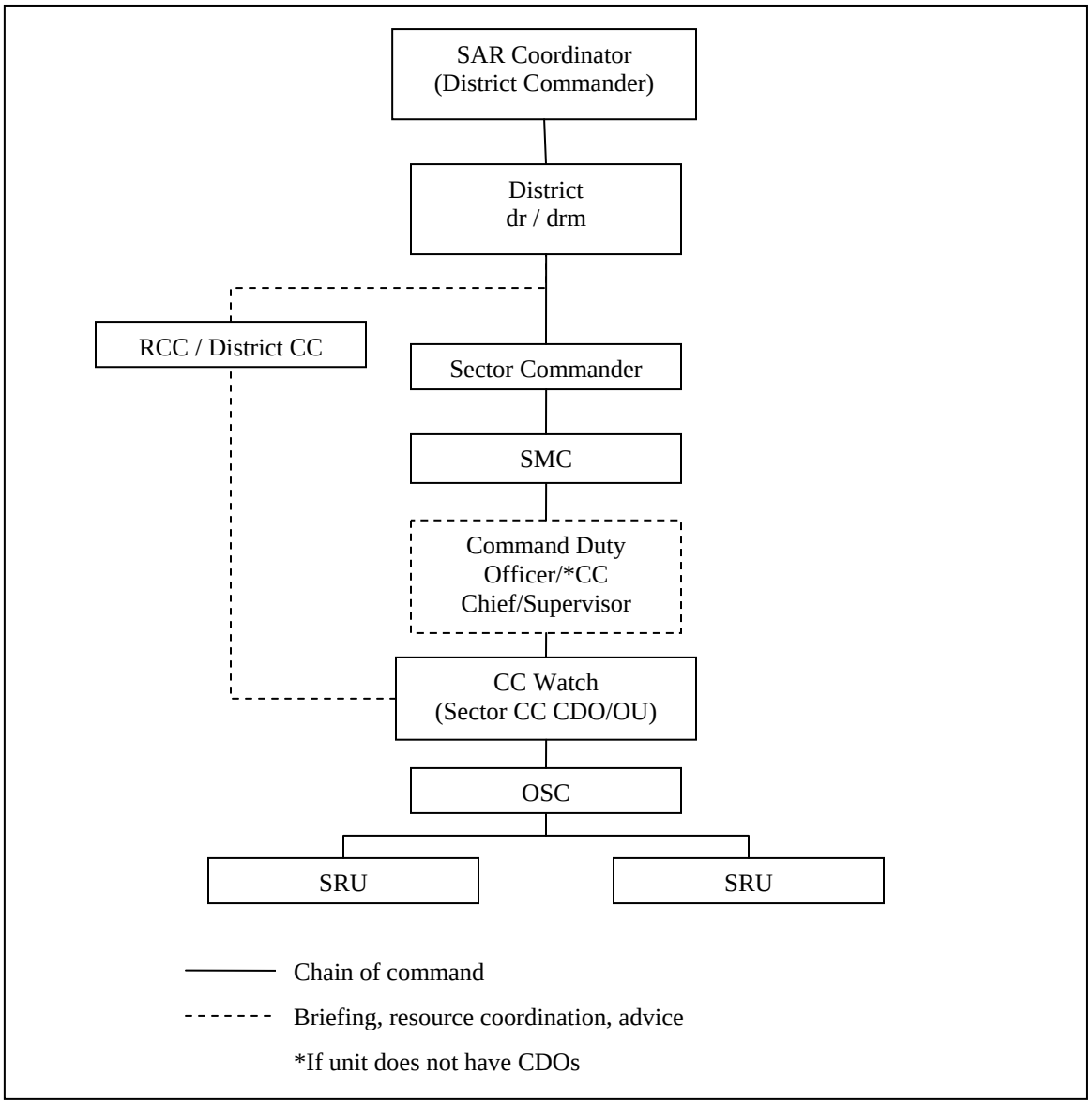


Figure 1-3 SAR Chain of Command with SMC at the Sector Level

1.2.2.3 SMC Designation

(a) Designation as an SMC is based on training and experience, rather than merely by position assigned within the chain-of-command. ***SMCs shall meet the training and knowledge requirements outlined in 1.3. Any person who has not completed the requisite training shall not be SMC.***

(b) SMC is a personal designation from SC and the Sector Commander to a qualified individual. ***As such, designation of each SMC within the District and Sector shall be re-issued upon change of command of the SC or Sector Commander.*** If only the Sector Commander changes, this is applicable for those personnel within that particular Sector.

(c) ***SMC designation shall occur in writing with a Letter of SMC Designation, and those letters shall remain on file at the District Command Center for District SMCs and the***

Sector Command Center for Sector SMCs.

(d) SMC designation authority rests with the SC, who may delegate this authority to Area/District Chiefs of Response for Area/District personnel and Sector Commanders for Sector personnel.

(e) Within the District and Sector construct, the following individuals should be designated SMC, to ensure personnel with the proper training and experience are assigned at all levels within the chain-of-command.

(1) District Chief of Response;

(2) District Chief of Incident Management;

(3) Sector Commander;

(4) Deputy Sector Commander; and

(5) Sector Chief of Response.

(f) SMC designation of Area/District and Sector personnel other than those listed above is authorized to accommodate periods of absence, to manage mission fatigue, and to strengthen selected designees' SAR knowledge and experience.

(1) ***The individual's Letter of SMC Designation shall be routed thru the SC for concurrence, and shall include supporting documentation of completion of professional requirements in accordance with Table 1-3.***

(2) Allowing these individuals to serve as SMC will provide the opportunity to develop future Response and Incident Management candidates. This will also limit overall risk exposure to the organization while ensuring that the majority of the time the SMC team has the best blend of technical competence, operational experience, and sound objective judgment.

(3) In order to maintain proficiency, all personnel designated SMC should serve as SMC on a regular basis.

(g) ***SC and Sector Commanders shall consider the professional experience of the individual.*** Consideration for SMC should be given to only those individuals who have been a Command Center Command Duty Officer, Command Center Chief, Incident Management Division Chief, or served as an Air Station Commanding Officer or Executive Officer, Sector Commander or Deputy Commander, or Chief, Response Department/ Group Operations Officer.

(h) Individuals not having previously filled those positions should complete at least six months in their current assignment prior to receiving designation as SMC.

(i) This SMC Designation policy does not preclude units from including individuals without a specific SMC designation in the SAR briefing process. Involvement of those individuals can promote training and professional development, and can provide additional resources to the SMC.

1.2.2.4 SMC Duties. The duties, responsibilities, and relationships (to the rest of the SAR Response System) of the SMC are described in References (a), (b) and (e). If the situation gets beyond

the capability of the current level of SMC, there should be no hesitation to shift the case up to the next level. When deciding whether a specific person is appropriate to act as SMC, consider the following about both the individual and command capabilities:

(a) The nature and complexity of the case. Factors that contribute to complexity include:

(1) Number of participating SAR facilities and their parent organizations (e.g. DOD, other nation, etc.);

(2) Number and complexity of probable scenarios;

(3) Numbers and types of search objects;

(4) Number of possible persons to be assisted/saved;

(5) Level of media interest;

(6) Other coincidental missions involved (i.e. pollution, mass rescue, law enforcement, etc.); and

(7) Pre-existing plans, MOUs, and relationships.

(b) Other factors to consider include:

(1) The adequacy of the unit's command, control, and communications capability in terms of equipment, personnel, training and experience,

(2) The unit's geographic proximity to the incident. Per Reference (a), if a SAR mission crosses areas of responsibility (AORs) or SRRs, the RCC within whose region the last position report was received assumes overall responsibility. If the last report received was at the boundary of two regions, or if no position report was received, the RCC of the region the craft was entering usually assumes responsibility.

(c) ***Amver accessibility shall reside at the District/Area level and will not be delegated to the Sector level.*** This does not preclude a Sector from requesting their District Command Center run an Amver SURPIC for a case where the Sector is SMC. However, Amver is most useful for offshore cases, usually outside Sector AORs. Typically, SMC for these types of cases resides at the District/Area level.

1.2.2.5 Initiating Responsibility. Responsibility for initiating a response to distress incidents and requests for assistance rests with the coordinator of the region or sector in whose area the incident occurs. ***When boundary or location ambiguities exist, the unit receiving initial notification shall assume SMC and take immediate action to provide a response. SMC of a distress incident shall be retained until the incident is terminated or until proper relief is effected.***

1.2.2.6 Coast Guard SMC Assumption. The Coast Guard should normally assume SMC according to Table 1-2, which is based on AORs. These SMC designations are the lowest levels normally assigned. SAR Coordinators may use discretion in SMC assignments where non-complex cases straddle sector (or district) boundaries and the mission may be effectively coordinated by one of the involved sectors (or involved districts).

(a) Incidents that require the SMC to be at the District RCC level or above are:

(1) Initial action for cases involving ELT and EPIRB, HF-DSC, and Inmarsat alerts; to

ensure that cases are managed effectively throughout the Coast Guard. When the actual situation of the alerting vessel is determined, the SMC can be shifted down to the sector level to coordinate the response.

(2) Cases outside the U.S. SRR where a Coast Guard RCC is carrying out the duties of "first RCC", where assistance is requested by an international RCC outside the U.S., or where U.S. citizens appear to be in distress outside U.S. SRR and involvement of a U.S. RCC is appropriate.

(b) ***Cases during which search planning by a Sector extends beyond 36 hours shall be evaluated by the District to determine the unit's ability to continue planning and coordinating the search effort.*** This required evaluation is just a review, not a signal for the District to automatically take SMC; in fact, keeping SMC at the Sector in many cases will be advantageous.

(c) The required review does not preclude shifting SMC up to the District level prior to the 36-hour mark.

(d) ***Decisions to shift or not shift the SMC in all cases shall be documented in the MISLE case file.***

(e) These guidelines do not preclude Districts from establishing their own policies for subordinate units regarding additional factors that contribute to case complexity and when SMC will be shifted to the District.

Table 1-2 Standard SAR Mission Coordinator Assignment

Incident Location	*SAR Mission Coordinator Assigned Within*
Single Sector AOR	Sector
Multi-Sector AOR's	District
Search and Rescue Sub-Region (SRS)	Sector; San Juan and Guam only
Single District Search and Rescue Region (SRR) outside Sector AOR	District
Multi-District SRR's	Area (Or as outlined in Area SAR Plan)
Other Nation SRR's	Other Nation RCC or U.S. RCC by international agreement

1.2.2.7 Delegating SMC. Districts will exercise great care in delegating SMC to subordinate Sectors whenever comprehensive SAR planning is involved or special coordination problems are anticipated, such as multi-service or multi-sector operations.

1.2.2.8 Reassuming SMC. ***Having delegated SMC, RCCs shall always be ready to assume SMC responsibility from subordinate Commands when they request relief from cases that exceed their capabilities or it becomes evident that relief would be appropriate.***

1.2.2.9 Transferring SMC. There will be occasions when it is appropriate to transfer SMC to another RCC either inside or outside the Coast Guard (national or international). A transfer may be appropriate when the other RCC is in a better position to handle the case.

1.2.3 Mission Briefings and Risk Assessment

Experience has taught us that doing everything right is no guarantee that a mission will not end in a mishap. But, we do know that not doing the right things right dramatically increases the

risk of death or injury to the people we serve and to ourselves. The following pages provide an overview for Operational Risk Management (ORM). There are various models and checklists that can be used (for examples, see Appendix E), but all of them have these factors in common: defining the task, identifying the hazards, identifying options, evaluating risk versus gain, and executing the decision. ***Regardless of the model or checklist a unit uses to evaluate operational risk, documentation of the completed risk assessment shall be included in the case file.***

1.2.3.1 SMC Risk Assessments and Briefings. ***SAR Mission Coordinators (SMCs) shall ensure risk assessments are conducted, communicated and documented at all levels of the SAR response and conduct briefings prior to launching or diverting resources for a particular SAR mission. SAR personnel shall be given all relevant details of the distress and all instructions for the SAR operation. This briefing shall, at a minimum, discuss the mission objective and all foreseeable hazards that might be encountered by the responding units.***

(a) Known risks may include, but are not limited to:

(1) heavy weather;

(2) poor visibility;

(3) hazardous bar conditions;

(4) critical navigation segments of the transit;

(5) placing Coast Guard personnel on disabled vessels; and

(6) presence or possibility of communicable diseases among mariners being rescued.

(b) ***SMCs shall ensure that all assets tasked understand the mission and the known risks, and have an appropriate SAR action plan. SMCs shall continually assess the situation as the mission proceeds, and consciously and continually weigh the associated risks against the desired gain. SMCs shall be responsive to safety or capability concerns raised by cutter CO/OinCs, aircraft commanders, and coxswains, and modify the SAR action plan as appropriate.***

(c) Appendix E includes various models recommended for use to assist in determining risk. Direction for conducting risk assessment within the command center for missions is provided in Reference (f). ***For cases involving a large number of SAR assets, and/or when direct communication between the SMC and each unit is not feasible, the SAR Action Plan shall address foreseeable hazards and known risks associated with a particular mission.***

(d) Even when not SMC for a particular case, the operational staff at Stations and Sectors retain their inherent responsibility for oversight of the SAR units (SRUs) assigned to them. The senior operational staff members at these units play a crucial role in risk assessment and risk management. ***Any tasking of SRUs that raises a safety or capability concern on the part of the parent unit shall immediately be brought to the attention of the SMC.***

1.2.3.2 Crew Briefings. ***A mission briefing shall be conducted among the crew of all SRUs prior to launching on a particular SAR case.*** Chapter 4 of Reference (g) outlines specific coxswain requirements for risk management, crew briefings and crew debriefs as part of standard boat operations. Aircraft commanders are responsible for all phases of flight, and are tasked with

ensuring that all crewmembers and passengers are properly briefed on all aspects of the mission. Coast Guard Flight Manuals for rotary wing aircraft require crew briefings prior to hoisting operations, and mandate a discussion of, among other things, the assignment of crew duties, a discussion of rescue methods to be used, and specific emergency procedures to be followed.

1.2.3.3 Training Sources. Specific Team Coordination Training requirements for active duty, civilian, reserve, and auxiliary members are outlined in Reference (h), Team Coordination Training. Chapter 4 of Reference (g), and the course book "Team Coordination Training Student Guide" (available from the Coast Guard Institute), are two excellent sources for Coast Guard specific training on Risk Management and Team Coordination.

All units conducting SAR operations will review these two documents and incorporate them within the unit's training plan. Reference (i) and associated job aids (available from Commandant (CG-1134), Afloat Safety Division website) should also be used to integrate Operational Risk Management (ORM) into daily SAR activities and processes.

1.2.4 Adverse Weather

1.2.4.1 As adverse weather is such an important, and relatively common, risk factor to be considered by the SMC and SRUs in the execution of a SAR case, the following definitions are extracted from the Boat Crew Seamanship Manual with the purpose of enhancing proper risk assessment:

1.2.4.2 Heavy Weather is defined as seas, swell, and wind conditions combining to exceed 8 feet or winds exceeding 30 knots. If heavy weather is forecasted, it should be considered when planning a mission. Reliable and up to the minute information is critical for planning. There are many sources of information available to the coxswains, heavy weather coxswains, surfmen, and commands of Stations. Ensuring that the information is found and used is the responsibility of everyone involved in the mission.

1.2.4.3 Rough bar/surf is determined to exist when:

(a) breaking seas exceed 8 feet;

(b) in the judgment of the Commanding Officer/Officer in Charge, rough bar/surf conditions exist; and/or

(c) in the judgment of the coxswain, there is doubt as to the present conditions.

1.2.4.4 ***When rough bar/surf conditions exist, a surfman shall be assigned as coxswain and all members of the boat crew shall wear all personal protective equipment unless waived by the Commanding Officer/Officer in Charge.***

(a) Rough bar – A rough bar is a river entrance or inlet where heavy seas or surf conditions exist. In situations when the coxswain or the CO/OIC is unsure, a rough bar is assumed.

(b) Surf – Surf is defined as the waves or swell of the sea breaking on the shore or a reef.

1.2.5 Health Risks

Rescue personnel frequently encounter persons who are injured or ill in the course of rescue work. ***Personnel must be aware of high threat and/or prevalent diseases in their operating region and in the area of origin of possible victims.*** Recognition of the symptoms of such

diseases, over and above possible injuries from the SAR incident, and use of proper personal safety procedures are critical. ***In addition, personnel must gain awareness of a person's medical and physical condition and how that may impact the ability of rescue personnel to effectively recover that person.***

1.2.5.1 General Health and Physical Condition. ***SMCs, OSCs and on scene rescue personnel shall seek information from potential rescue subjects on the general state of their health and physical condition prior to conducting hoisting or recovery to rescue vessels.***

(a) During MEDEVACs health and physical condition are primary focuses in the information gathering that is necessary for the response. ***SMCs and on scene personnel shall ensure this information is shared with others involved in the response as needed to aid in recovery, transport and reception ashore.***

(b) For SAR incidents other than MEDEVACs the health and physical condition of persons should also be of primary concern but may be overshadowed by the emergent events of the incident itself. In many distress situations the SAR response may become focused on performing the actions necessary to mitigate the situation on scene (e.g. sinking vessel, drifting into danger, etc.).

(1) ***When a distress incident is reported, communication with the distressed persons is possible, and time exists to gather information while rescue units are enroute, information on the health and physical condition of each individual subject to the distress shall be sought.***

(2) ***In situations where the rescue units are on scene and information could not be gathered prior to arrival due to either lack of communications or insufficient time, on scene personnel shall make every effort in the process of recovering individuals to ascertain any injuries, health concerns and physical limitations which may impact the recovery process or present a risk for additional injury.***

(c) The above does not preclude rapidly recovering individuals from immediate life threatening situations (e.g. vessel on fire, vessel going under or capsizing, multiple persons in the water without personal floatation devices or other means of flotation assistance, etc.) where delay to ascertain health/physical issues would likely result in additional injury or death.

1.2.5.2 Specific Health Risks

(a) **Blood-Borne Pathogens**. Possible exposure to blood-borne pathogens exists during any SAR case. All SAR personnel should be cognizant of the possible presence of blood-borne pathogens and use sound situational awareness when planning and/or dispatching personnel to the scene of an incident. Appropriate safeguards should be put in place to protect rescue personnel from possible infection.

(b) **Respiratory Diseases**. During SAR incidents, rescuers may encounter persons who have infectious respiratory diseases such as the Severe Acute Respiratory Syndrome (SARS) and other viruses that are of an epidemic or pandemic nature. Rescue personnel should stay informed of current disease threats and keys to recognizing symptoms that may indicate persons they are rescuing may be infected. Appropriate safeguards should be put in place to protect rescue personnel from possible infection.

(c) **Hazardous Medical Devices.** During the recovery of SAR victims, rescuers may find the victim has internal or external medical devices that may prove hazardous during recovery. One such hazard is the increasing use of Automatic Implanted Cardioverter Defibrillator (AICD), more commonly referred to as Internal Defibrillators, for heart patients in lieu of pacemakers. AICDs deliver a significant shock to the patient, strong enough to knock them or anyone in contact with them to the ground, if the subject's heart rate becomes excessively elevated (such as during a rescue case or other traumatic event). This can pose a particular hazard to rescuers as it could momentarily incapacitate them while performing a rescue. During pre-rescue questions where heart ailments are identified by rescue subjects, SAR personnel should further inquire about AICDs and ensure those effecting the rescue on scene are aware of any devices and associated cautions.

Section 1.3
Professional Requirements

Training and experience are crucial to proper SAR response. Training combined with a demonstrated ability to perform the required tasks can lead to certification by the command that the individual is ready, willing, and able to assume SAR watchstanding duties. Command leadership plays a significant role in shaping the watchstanders' attitudes towards SAR. It is expected that Sector Commanders and Station Commanding Officers/Officers in Charge will issue guidelines delineating their expectations regarding such things as notifications, specific interagency interactions and other matters specific to the command's AOR. These guidelines are not intended to replicate requirements published elsewhere, but rather to clarify the command's expectations in instances where that authority is allowed.

For purposes of this instruction, all references to the SAR watchstander are intended to address the Command Duty Officer and Operations Unit watchstanders. Likewise, SAR watchstander qualifications apply to all SAR watchstanders at the Area, District, and Sector levels.

NOTE: ***A newly assigned SAR watchstander shall attend the Maritime Search Planning Course at the earliest practical date.*** While awaiting assignment to the Maritime Search Planning Course, a prospective SAR watchstander should be closely supervised in an on-the-job training status.

1.3.1 Training

Training consists of on-the-job training, structured unit training (to include appropriate written exercises), and formal training. All RCCs, RSCs, and Sectors will implement a formal program to qualify members of the command that are part of the SAR system. Table 1-3 shows the minimum level of SAR knowledge expected for various positions. Table 1-4 shows the formal courses required for SAR watch and chain of command positions.

1.3.1.1 Training Program Elements. Elements of the program will include:

(a) A written form of performance qualification standard (PQS). At a minimum, SAR watchstanders will complete the performance elements found in Reference (f), which includes completion of Appendix N of this Addendum. Appendix N addresses SAR specific requirements.

(b) A period of supervised watches; a minimum of 15 for initial qualification.

(c) A qualification board

(1) ***SAR Watchstanders shall pass a qualification board.***

(2) ***The qualification board shall consist of a minimum of three members, including the Chief of Incident Management (District level) or Chief of Response (Sector level), the Command Center Chief/Supervisor, and at least one other qualified watchstander. Of these members, at least one person shall be a designated SMC.***

(d) A certification letter signed by the District Chief of Incident Management for RCC watchstanders, or the Sector Commander for those assigned to Sectors. ***The District Chief of Incident Management / Sector Commander shall conduct a one-on-one interview with each prospective SAR watchstander prior to certification.*** This interview is to aid in affirming the readiness of the individual as well as an opportunity for command SAR

philosophy to be passed directly to the new watchstander.

(e) ***The Command Center Chief shall validate that all required annual training has been completed in accordance with Table 1-4 and documented in TMT***.

(f) A recertification letter, signed by the Command Center Chief, if a SAR watchstander lapsed in currency or had certification removed due to poor performance, in accordance with 1.3.3.2.

1.3.2 Qualification/Currency

1.3.2.1 Qualification Procedures. ***Upon completion of training, the prospective SAR watchstander must undergo qualification procedures, a process of demonstrating the capability to perform assigned tasks. SAR watchstanders shall be qualified in SAR incident analysis, search planning, and mission management as described in Reference (a).***

1.3.2.2 Interim Qualification. Commands may not designate SAR watchstanders with an Interim Qualification. ***Any person performing SAR watchstanding functions in the command center shall be qualified.*** Persons in training may perform SAR tasks/functions under the direct supervision of a qualified SAR watchstander. ***Commands unable to meet this standard shall seek guidance from their chain of command on how to provide for continuity of operations.***

1.3.2.3 Currency Training Program. ***To maintain currency, commands shall develop a comprehensive annual training program for all watchstanders (including Reservists and Auxiliarists).***

(a) ***The currency training program shall cover all topics in Table 1-3, with knowledge areas marked 'Proficiency' completed annually for recertification. In addition, the program shall include a review of updated policy guidance (including information from Headquarters, SAR School/Command Center Standardization Team (CCST), Areas and Districts).***

(b) ***For qualified SAR watchstanders the program shall include a practical exercise requirement for a minimum of three completed SAROPS drift scenarios per quarter. The exercises shall be briefed to a designated SMC, to include an explanation of decisions made for type of scenario, search objects, and SRUs selected; and a discussion of the resultant survival implications and search effectiveness (probability of success (POS)). The Command Center Chief or Supervisor shall also review the quarterly scenarios following briefings to the designated SMC. Two of the three exercises may be exempted through an actual SAR case that includes search planning efforts utilizing SAROPS.***

(c) ***Completion of this training shall be documented in members' training records (documented in TMT).***

Table 1-3 SAR Knowledge Requirements

Knowledge Area	Column 1 Command Cadre / **ACTSUS**	Column 2 Chief, Response Department / **SMC**	Column 3 Command Center Chief / Supervisor & **SAR Watchstanders**
Area Familiarization	K	K	P
SAROPS and other automated SAR applications [1]	A	K	P
Case claiming/documentation	A	K	P
Chain of command notification/requirements	P	P	P
Datum and search area computations	A	K	P
Firefighting and General Salvage Policies	P	P	P
Hoaxes and Uncorrelated MAYDAY response Policies	P	P	P
Interagency cooperation / protocol / procedures	P	P	P
Major/Minor SAR responses	K	P	P
Maritime SAR Assistance Policy	P	P	P
Message preparation	A	K	P
Resource characteristics (traditional and nontraditional)	K	P	P
Risk Management	P	P	P
Search pattern criteria/selection	K	K	P
Suspension process	P	P	P
Use of QRCs/Job Aids/Checklists	A	K	P

Notes for Table 1-3:

1 SAROPS and other automated SAR applications: The various SAR Tools may not be required or apply at all levels and all commands. Tools include but are not limited to Amver, SAROPS, MISLE, MMSI database, sound manipulation software, and hypothermia/survival software.

Key:

P = Proficiency in performance of functions or tasks within the knowledge area

K = Knowledge of functions or tasks within the knowledge area; able to assist or perform with aid

A = Aware of functions or tasks within the knowledge area and their importance and role in SAR

Table 1-4 SAR Course/Workshop

Course/Workshop	Column 1 Command Cadre / **ACTSUS**	Column 2 Chief, Response Department / **SMC**	Column 3 Command Center Chief / Supervisor & **SAR Watchstanders**
Maritime Search Planning Course		R/M[1]	M
SAR Supervisor Course	M	M	
SAR Fundamentals (e-SAR) Course	R	R	R
Search Coordination and Execution	R	R	R

Notes for Table 1-4:
1 See 1.3.2.4.(b) for clarification of mandatory and recommended Maritime Search Planning Course attendees in Column 2
Key:
M = Mandatory
R = Recommended

1.3.2.4 Explanation of SAR Knowledge (Table 1-3) and Course Requirements (Table 1-4).

(a) **Command Cadre / ACTSUS authority.** ***Elements of column 1 of SAR Knowledge Requirements (Table 1-3) and the SAR Supervisor Course shall be completed prior to receiving ACTSUS delegation from the SC.***

(1) ***At the Area/District level, SAR knowledge requirements shall apply to: Area/District Commander, Chief of Staff, Chief of Response, Incident Management Branch Chief, regardless of SAR authority delegation, and any other personnel who are delegated ACTSUS authority by SC.***

(2) ***At the Sector level, SAR knowledge requirements shall apply to the Sector Commander and the Deputy Commander.***

(3) If Command Cadre members attend the Maritime Search Planning Course within one year of assignment to the Command Cadre position, the SAR Supervisor Course requirement may be waived by SC.

(b) **Sector Chief of Response / SMC.** ***Elements of column 2 of SAR Knowledge Requirements (Table 1-3) and the SAR Supervisor Course shall be completed prior to receiving SMC designation from the SC / Sector Commander.***

(1) For purposes of this Section (1.3.2.4), SMC applies to any member at the Area / District / Sector levels with an SMC designation.

(2) ***Sector Chiefs of Response and other individuals desiring SMC designation shall be Maritime Search Planning Course graduates.***

(3) The Maritime Search Planning Course is recommended, but not required, for Sector Commanders and Deputy Sector Commanders to receive SMC designation.

(4) If Sector Commanders and Deputy Sector Commanders attend the Maritime Search Planning course within one year of assignment to their position, the SAR Supervisor Course requirement may be waived by SC.

(5) If a member is delegated ACTSUS authority and is designated as SMC, the higher of the knowledge requirements is required (i.e. Proficiency is a higher level than Knowledge, and Knowledge is a higher level than Awareness).

(c) **Command Center Chief / Supervisor and SAR Watchstanders.** ***Elements of column 3 of SAR Knowledge Requirements (Table 1-3) and the Maritime Search Planning Course shall be completed prior to receiving certification in positions from the SC / Sector Commander.***

(1) ***SAR watchstanders shall be required to return to the Maritime Search Planning Course if the length of time from the date on their last re-certification letter has exceeded five years.***

(2) ***SAR watchstanders who remain in active SAR billets shall return to the Maritime Search Planning Course every eight years or prior to assignment in a third consecutive SAR billet.***

(d) **Course Waivers:** ***All desired waivers of course attendance for personnel seeking ACTSUS delegation or SMC designation shall be routed through Area Incident Management to Commandant (CG-SAR) for approval, prior to receiving delegation/designation.***

1.3.2.5 Watch Frequency Requirements. All qualified SAR watchstanders are required to maintain watch proficiency through the use of currency watches.

(a) ***All qualified SAR watchstanders shall stand a minimum of two watches per month for the purpose of remaining current on watch policy and procedures***. Command Duty Officers are not required to stand two additional watches per month to maintain currency at the Operations Unit watch position.

(b) ***Watchstanders failing to meet the watch frequency requirements or to maintain currency must be recertified by the command.***

1.3.2.6 Demonstrating Proficiency. ***To maintain the integrity of the SAR system, all members involved in the SAR system shall meet minimum knowledge requirements listed in Table 1-3 above. All qualified watchstanders shall demonstrate proficiency through completion of quarterly exercises, as outlined in 1.2.2.3.*** These may be locally derived or provided by their parent command. Watchstanders may fulfill this requirement either through tabletop exercises (SAROPS problems) or written tests. ***Watchstanders must demonstrate proficiency in the areas shown in Table 1-3.***

1.3.2.7 Collateral Duty Assignment. Commands should carefully consider the type and number of collateral duties assigned to SAR watchstanders and the Command Center Chief/Supervisor/Senior watchstanders. SAR watchstanders/Supervisors should not be assigned collateral duties that significantly degrade their ability to properly stand the watch, maintain currency, or inhibit the maintenance of a proper watch rotation. ***Further, Senior SAR watchstanders/Command Center Chiefs/Supervisors shall not be assigned collateral duties that would degrade their ability to exercise oversight, quality control, and leadership to a Command Center staff.***

1.3.3 Certification.

After completing qualification procedures, personnel must be certified in writing by their command prior to being assigned RCC, RSC, or Sector Command Center SAR watchstanding duties. This is where the individual's maturity and judgment are taken into account. ***Recertification procedures must also be documented and signed by the command.***

1.3.3.1 Annual Recertification. ***Annual recertification shall be completed by SAR watchstanders to validate that quarterly and annual training requirements have been met within the training cycle. The Command Center Chief shall review and validate that annual certification requirements have been met at the conclusion of the training cycle with documentation in TMT.***

1.3.3.2 Recertification Process Outside of Annual Training Cycle. The requirement to recertify outside of the training cycle is normally a result of watchstanders not maintaining currency (not meeting currency training or watch frequency requirements) or having their certification removed due to poor performance. For poor performance, commands have discretion to set the level of actions required to be reinstated as a watchstander within the range of actions: the minimum for poor performance being recertification, the maximum to complete the full qualification/certification process. ***Each command shall establish a recertification process that at a minimum:***

(a) Includes a period of supervised watches until recertified. The minimum standards are listed in Table 1-5. These represent only the minimums; in some regions the complexity of operations and corresponding complexity present in the command center watch may call for a greater number of supervised watches to bring an individual back up to proficiency. The supervision of the watches should be conducted by experienced watchstanders (i.e. not by recently qualified watchstanders).

Table 1-5 Supervised Watches for Recertification

Recertification Reason	Minimum Number of Supervised Watches Required	Notes
Currency Training lapse	continuous	Until training requirements are met
Watch frequency lapse < 30 days	1	Recommended; may be waived by command
Watch frequency lapse 30 to 90 days	2	May be waived by the command if the frequency lapse was due to attendance at National SAR School or Command Center Watchstander courses.
Watch frequency lapse > 90 days	6	

(b) Includes meeting the training currency requirements in 1.3.2.4 (knowledge requirements in Table 1-3).

(c) Includes a command formal re-certification board. Number of board members and composition should be flexible and reflective of the reason for recertification (e.g. for a lapse < 30 days an interview with the command center supervisor may be adequate; for

lapse > 90 days a full board similar to the initial qualification board may be appropriate).

(d) Documentation via a re-certification letter.

1.3.4 Professionalism/Standardization

1.3.4.1 Command Center Standardization Team. Because of the critical nature of Command Center decision-making, there is a need for service-wide standardization. This includes periodic independent review and evaluation. The Command Center Standardization Team (CCST) provides Area, District, and Sector Command Centers periodic assessments of search planning and rescue coordination proficiency, training and certification, watch organization, documentation, command relationships, C3 capability, and knowledge of reference materials. In order to allow for the evaluation, update, & overall improvement of search policies, procedures and program goals, the CCST will provide Commandant (CG-SAR) with copies of the assessment reports.

1.3.4.2 District Professional Liaison. ***Districts shall assign a command center watchstander as a professional liaison to each Sector within its AOR. The Liaison shall visit his or her assigned unit at least twice a year to discuss relevant SAR issues and conduct requested training.*** Additional visits may include, when the subordinate unit is conducting a SAREX and when the CCST is conducting a visit.

1.3.5 SAR School Quota Assignment Prioritization

The curriculum of the National SAR School and changes to the numbers and types of SAR courses available, necessitate guidance for the assignment of quotas to prospective students of the National SAR School.

1.3.5.1 Maritime Search Planning Course (340440). Sufficient Maritime Search Planning (MSP) quotas exist for Coast Guard personnel filling SAR watchstander and Sector Response Chief billets. Additional quotas are available to provide training to members included in unit "briefing chains," or personnel who have a responsibility to communicate the specifics of a SAR case up the chain of command or exercise oversight to the watch during the development of a SAR case. Twenty-five quotas are available each year for Department of Defense personnel. In assigning students to MSP convening's, Training Quota Management Center (TQC) should adhere to the following guidance:

(a) ***Coast Guard personnel shall be assigned quotas based on the following priority:***

(1) Commandant (CG-SAR) approved special requests – Commandant (CG-SAR) will set priority);

(2) Operations Unit watchstanders (Active duty / Civilian);

(3) Command Duty Officers & Command Center Chiefs/Supervisors;

(4) Sector Chief of Response Department;

(4) Sector Incident Management staff;

(4) Operations Unit watchstanders (Reserves / Auxiliary);

(5) All others on a space available basis with Commandant (CG-SAR) concurrence.

(b) International students. No more than five quotas per class convening of the regular MSP course; quotas to the regular MSP convening's will not exceed 40 per year without Commandant (CG-SAR) concurrence.

(c) DOD Personnel. No more than three quotas per regular class convening; quotas will not exceed 25 per year without Commandant (CG-SAR) concurrence. ***At least 30 days advance notice must be given to TQC in order for DOD to utilize these quotas for a given class convening. DOD quota requests shall be prioritized as follows:***

(1) Air Force personnel are allowed a maximum of two seats per class.

(2) Other service branches on a space available basis.

(d) ***TQC shall refer any request to re-attend the MSP course that falls within three years of the requester's previous MSP graduation date to Commandant (CG-SAR) for approval.***

1.3.5.2 SAR Supervisor Course (501271). Sufficient SAR Supervisor Course quotas exist for Coast Guard personnel who will be designated SMCs. Additional quotas are available to provide training to personnel who serve in billets within the SAR chain-of-command.

(a) ***Coast Guard personnel shall be assigned quotas based on the following priority***:

(1) Area/District Chiefs of Incident Management, Sector Commanders/Deputies;

(2) Area/District Chiefs of Response, Sector Chief, Response Department;

(3) Command Center Chiefs;

(4) Air Station CO/XO/OPS;

(5) All others on a space available basis with Commandant (CG-SAR) concurrence.

1.3.5.3 Search Coordination and Execution (SC&E) Exportable Course (400385). It is the responsibility of the visited District to provide funding and quota management for students to attend SC&E. Completion of this course fulfills the requirements for designation as Aircraft Commander as required by the Air Operations Manual and coxswain as required. The National SAR School will provide student rosters to TQC as soon as possible after class graduation.

1.3.5.4 SAR Fundamentals e-SAR Course. e-SAR is a computer-based interactive Training system that meets the SAR knowledge requirements for becoming an aircraft commander or boat coxswain. It combines the legacy correspondence course, SAR Fundamentals, with the Exportable Search Coordination and Execution course to give the pilots and boat crews a thorough familiarization of the Coast Guard SAR system and the on scene commander's responsibilities.

(a) The e-SAR course (code 0432-1) is available by accessing the USCG virtual classroom found on the Coast Guard learning portal at https://learning.uscg.mil.

(b) ***Your education services officer (ESO) must proctor your e-SAR end-of-course-test (EOCT) conducted online.***

(c) Units which cannot use the on-line course due to deployment, remote locations or insufficient bandwidth should have their ESO request a portable version from the National SAR School.

Section 1.4
Public Affairs & Next of Kin Interactions

Public affairs for the Coast Guard is different from that for the other armed services and most other Federal agencies due to our unique missions which serve the citizens constantly and directly. Coast Guard search and rescue operations always have the potential to create considerable public interest. The image of the service is often "on-the-line" due to SAR and therefore, how a SAR incident is reported will affect the service either positively or negatively.

1.4.1 News Releases and Interviews

Reference (j) lists excellent instructions on news releases for SAR cases and is mandatory reading for all personnel at Coast Guard units that interact with the public as part of their duties. However, it is often found that Coast Guard personnel directly involved in a SAR case are interviewed with little or no advance notice. ***Boat coxswains, OODs, and crewmembers must be aware that they are all potential candidates for the camera or reporter's notepad.*** Dedicated public affairs personnel are very valuable for handling media requests and enabling search planners to remain focused on planning efforts.

1.4.1.1 Release of Names During Active SAR Cases. The release of information to the public concerning individuals being sought or having been rescued by the Coast Guard often supports the SAR mission.

(a) The release of names of individuals being sought or having been rescued by the Coast Guard may be released by the responsible PAO or SMC while a SAR case is open and active.

(b) ***Once a SAR case is closed or suspended in MISLE, any request for names of individuals rescued by the Coast Guard must be submitted by the requestor IAW Reference (k).***

1.4.2 Training and Education

Unit commands are encouraged to educate their personnel on public affairs. All watchstanders should be aware of information release criteria related to the privacy act, next-of-kin notification and ongoing investigation limitations (Reference (k)). When in doubt, contact the public affairs office within your chain of command. Training is available for personnel with public affairs responsibilities through the Defense Information School (DINFOS), Commandant (CG-0922) or the nearest District Public Affairs Office. The National SAR School has prepared a comprehensive guide for members faced with this difficult task. It can be found on the SAR School web site: http://cgweb.tcyorktown.uscg.mil/sar/index.asp.

1.4.3 Next of Kin (NOK) Notification and Interaction

1.4.3.1 General Discussion. ***SAR Coordinators shall ensure the greatest possible sensitivity in interacting with family and friends of victims during the conduct of SAR cases where the Coast Guard is the lead agency. The person exercising ACTSUS authority shall personally ensure that notifications are made and interaction established with the NOK at the earliest possible time.***

1.4.3.2 Appropriate Coast Guard Point of Contact. It is recommended that the person exercising

ACTSUS authority personally handle this interaction. However, in the event that is not possible, this responsibility may be delegated to a mature member of the Command who may be physically proximate to the NOK (e.g., Station CO/OINC) and who is thoroughly familiar with the case. When an Area or District assumes SMC from a subordinate command that has ongoing communication with the next-of-kin, it may be appropriate to continue contact with the next-of-kin at the lower level.

1.4.3.3 Prolonged Searches for Missing Persons. Notifications of missing persons are usually made by family members or friends. However, if it is not the NOK, then they should be contacted as soon as possible.

(a) The initial notification by the person exercising ACTSUS authority, or his/her designated representative, should include a summary of the search efforts so far, future plans and a Coast Guard point of contact for future interactions. The possibility of not finding their family members should be included in the list of possible scenarios.

> **Note:** If possible, the command should highly encourage NOK to have one person act as point of contact and spokesperson for the family. These interactions should be as humanitarian as possible and there should only be one Coast Guard point of contact for the family.

(b) In accordance with Section 1.10.7 of Volume II of Reference (b), the person exercising ACTSUS authority, or his/her designated representative, should maintain daily contact with NOK providing them with the progress of ongoing search efforts and outlining future search plans. This helps reduce NOK's stress associated with waiting and not knowing what happened to their loved ones and assists them in accepting the SMC's decision to suspend the search effort even if the missing persons are not located. Additionally, this provides for orderly interaction and, in turn, less distractions for SAR response personnel.

> **Note:** The NOK should be provided information on mission progress and future actions before releasing it to the media.

(c) If requested, allow the family to visit the District Command Center or Sector Command Center, as applicable, to review details of the case. Seeing the search planning and coordination efforts may help them accept the situation. The person exercising ACTSUS authority, or designated point of contact, should accompany the family when visiting the Command Center.

(d) Keep all briefings to NOK simple and avoid SAR acronyms and terms or any tables/tools that objectively measure survivability. General descriptions such as the type and number of SRUs, hours and square miles searched and general weather conditions should be used in briefing family members, as these factors are usually easy to understand. Also, take care to avoid creating a false sense of hope or making unrealistic promises to NOK. Under extreme emotions, it is easy to misinterpret "We're doing everything we can to find your husband" with "We will find your husband."

1.4.3.4 Suspending a Search. As the search progresses with no significant developments, it is helpful to remind NOK that the search cannot go on indefinitely. For prolonged searches, in accordance with Section 8.3.4 of Volume II of Reference (b), NOK should be notified of the decision to suspend active searching if no significant developments occur at least one day prior

to actual suspension. This prepares the family for the actual ceasing of operations while giving them at least one more day of hope.

The person exercising ACTSUS authority shall be the one to inform the family that active searching has been suspended, as the person who is responsible for making the decision. When the person exercising ACTSUS authority cannot make this call personally, the next senior officer should make the notification and pass along condolences on their behalf. Upon request, the family should be given a summary of the search effort and the opportunity to ask questions. The family should be reminded that although the active search has been suspended, Coast Guard units would continue to monitor the area for significant sightings and additional information. When the possibility exists that the case may involve a Marine Casualty Investigation, the SMC should facilitate linkage of the families with an appropriate person in the Prevention Department for continued liaison and information sharing regarding the investigation.

1.4.3.5 SAR Cases Involving Large Numbers of Victims. There are some SAR cases that typically involve large numbers of victims, particularly in a mass rescue operation (i.e. sinking cruise ship) or an incident that involves mass casualties.

Note: For airline crashes, airline companies are responsible for making NOK notifications.

In addition to the policy outlined above, the following procedures are extremely helpful when dealing with multiple NOKs (if the Incident Command System (ICS) is activated, then the Incident Commander (IC), not SMC, will be responsible for NOK interactions):

(a) Ensure that lodging is centrally located and/or easily accessible for those NOK who arrive in the area. This will facilitate daily briefings.

(b) Establish area where families of victims can receive daily mission briefings in private. This should be at the place where NOK are centrally lodged.

1.4.3.6 Loss of Life. ***In the event death occurs, the person exercising ACTSUS authority shall personally ensure that notification is made as expeditiously as possible, and with all due compassion.*** For those cases where the Coast Guard is not the lead agency or where interaction with NOK has not had the opportunity to develop, the command should endeavor whenever possible to use local, more qualified authorities for death notification. Local and state police departments are usually in the best position to make notification visits and are typically trained to perform this function. They are also networked with other agencies outside their jurisdictions and can make timely notifications in other counties or states. Sector Commanders should partner with these agencies and establish agreements on how NOK notification should be made for local and out of state residents.

(a) When local agencies are not available to make a NOK notification, the person exercising ACTSUS authority may have to do it directly. This may also be the case if the family is already aware of the situation and has established a good interaction with the command (if this is the case, person exercising ACTSUS authority can use their judgment as to whether notification should be made over the phone or through a personal visit).

(b) Regardless of how the contact is made, the following guidance is provided to assist in preparing to give notification:

(1) Obtain as much information as possible and have many of the facts committed to memory. Know the names of both the victim and NOK being notified and their relationship. Be prepared to answer questions and provide a point of contact at the facility where the body is located.

(2) Wear an appropriate uniform and ensure you have military identification. Whenever possible, travel in a government vehicle.

(3) Ideally, you want to make the notification to the primary NOK (i.e., spouse or parent). Make every attempt to inform the NOK in private. If you are at the residence, ask if you may enter. Speak quietly to the NOK until you gain approval for entering the house and closing the door. Do not enter without permission.

(4) Once inside, everyone should be seated. Be direct and to the point when informing the NOK. Do not sugarcoat your information. Using euphemisms or vague language may delay the NOK's acceptance of what has occurred. The words "dead" and "death" have a finality that has been found to be helpful for gaining NOK acceptance.

(5) As mentioned earlier, do not use technical SAR language. If appropriate, general descriptions such as the type and number of SRUs, hours and square miles searched and general weather conditions should be used in briefing NOK.

(6) Be prepared for a wide range of responses from denial to extreme physical or emotional responses such as fainting, anger, hysteria or even a heart attack. If necessary call local emergency medical services (have contact number and the NOK address readily available). Ask the NOK if other family, friends or clergy should be notified and offer to do it.

(7) Family members are not encouraged, but are welcome to come to the Command to review details of the case. When possible the review should be conducted in a space separate from the command center. Family members may be given a tour of the command center prior to or following the case review to give them an appreciation for our operations and capabilities.

1.4.3.7 Presumption of Death. There are times when NOK of missing persons who are presumed dead approach the Coast Guard and request a Letter of Presumed Death (LPD), usually to assist in insurance and probate court proceedings.

(a) An LPD may be issued upon request any time after the SMC has suspended the search, an Incident Investigation Activity (IIA) initiated in MISLE and the marine casualty investigation has commenced. Because the missing person's status is usually known very early in most investigations, an LPD should be issued by the Officer in Charge, Marine Inspection (OCMI) as soon as possible after receiving a request and need not wait for final completion of the investigation. Upon issuance, an electronic copy of the signed LPD shall be included in the Correspondence section of the MISLE IIA.

(b) If a marine casualty investigation is not conducted regarding a recreational death(s) or an overdue vessel, issuing an LPD is not authorized. Local or state authorities have jurisdiction over these cases and they perform these functions. If the NOK are unable to get an LPD from a local agency, they may request some form of proof from the Coast Guard. If they do, the SMC for the case, after consulting the Servicing Legal Office, may

provide the facts of the case, including the search parameters, results, probability of success, and a description of the Coast Guard's efforts. This may be provided in the form of a declaration, affidavit, or deposition. (Depositions may be authorized on a case-by-case basis with the approval of the Servicing Legal Office). The affidavit or declaration provides only facts and opinions within the Coast Guard's competence, and makes no conclusion regarding death. In these cases, the competent jurisdiction will use the Coast Guard's input to make the declaration regarding presumption of death.

1.4.3.8 Counseling Aid to Families. In cases where death occurs, or unlocated persons exist at the time of case suspension; the families may need further assistance coping with the tragedy. Coast Guard SAR units will endeavor to use local agencies and nongovernmental organizations, whenever necessary to assist the families. These agencies are typically trained to perform functions such as grief counseling, trauma management, etc. ***If agreements/understandings are not in place, Sector Commanders shall address this issue with local authorities to gain their cooperation.***

Section 1.5
Liaison and Contingency Exercises

SAR Coordinators will carry out active liaison efforts with organizations that can contribute to strengthening the readiness and capabilities of the international, national or local SAR systems. Such activities often help mitigate and control future emergency situations. Development and exercise of plans and improvement of communications are part of this work.

SAR Coordinators and RCC staff should routinely meet with counterparts in neighboring nations to work on improving working relationships, or to further implement international SAR agreements. ***However, any international SAR liaison efforts that may be sensitive, particularly significant, or otherwise non-routine must be coordinated in advance with the International Affairs Staff (Commandant (CG-DCO-I)) and SAR Program Manager (Commandant (CG-SAR)) at Headquarters.***

SAR liaison with states can be conducted under the Boating Safety Program (Reference (l)). Liaison should also be carried out with local military commands, commercial SAR service providers, local SAR organizations, and any others who may contribute to improving SAR operations, or expanding available resources. Membership and involvement in the National Association of Search and Rescue is recommended.

1.5.1 Contingency Response Community

Maritime SAR Councils, usually organized by the Coast Guard, are committees of federal, state, local, or volunteer groups with SAR capabilities. These councils are governing bodies of the SAR community that are localized within the maritime SAR area. They enable SAR coordinators to coordinate efforts of local SAR organizations on a long-term basis. Such councils are usually identified with bodies of water such as lakes, bays, or sounds, or with adjacent metropolitan areas, and may include land areas within the maritime SAR area.

1.5.1.1 A SAR Council coordinates the activities of various groups, resolves SAR operational problems, develops contingency plans, and critiques exercises and major SAR incidents.

1.5.1.2 Councils should include scuba clubs, professional divers, firefighting services, emergency medical services, commercial assistance providers, similar groups with specialized SAR capabilities, and groups that normally respond to SAR incidents. In addition, the councils should be closely tied to other emergency management organizations such as the Federal Emergency Management Agency (FEMA), state and county emergency management agencies, and Coast Guard Captains of the Port.

1.5.2 SAR Facility List

All RCCs/Command Center's shall maintain a current Search and Rescue Facility (SARFAC) listing. The list shall be validated annually. At the Sector level, the SARFAC list shall include all assets available within the AOR that can assist in responding to SAR, and at the District level, all assets available to the District. Facility listings are particularly important for identifying capabilities not held by the Coast Guard.

1.5.2.1 ***Operational Commanders shall ensure they have 24-hour contact numbers for DOD, state, county, municipal, volunteer, and commercial SAR resources in their AORs, including hospitals, ambulances, and coroners.***

1.5.2.2 ***Listings of dive rescue resources must include all available agencies and organizations with dive rescue capabilities.*** Specific information regarding transportation available or needed and pickup points for dive teams should be included. ***Dive rescues generally require an immediate response; all means for contacting dive teams 24 hours a day must be included.***

1.5.2.3 When planning for a search using another agency's SRU, answers to the following questions should be known:

(a) What are the operating limitations of your resource?

(b) What is your response time?

(c) When can you be on scene?

(d) How will communications be conducted?

(e) Can your resource handle hoisting operations or MEDEVACs?

(f) How long can your resource stay on scene?

Information on another agency's SRU may be in the form of an Operational Asset SARFAC or it may be common knowledge for your watchstanders. Undoubtedly, you will not be able to maintain as much information on these resources as you have for Coast Guard boats or aircraft; however, all information is useful in planning. This knowledge may also prevent the loss of vital time.

1.5.2.4 Units will establish and validate 24-hour contact numbers for local authorities who are responsible for public safety, bridges, tunnels, pipelines, and other facilities subject to waterways incidents in the vicinity of the exercise. Key points of contact include those who operate these facilities and those who control traffic on, over, or through them.

1.5.3 Mass Rescue Operations Contingency Exercises

The Coast Guard's MRO Contingency Program is consists of many elements. However, two key elements, plans and exercises play an essential part of the mass rescue operations. Plans are required to ensure that the Coast Guard maintains a strong response capability, always ready to fulfill our commitments as a multi-mission organization which includes our myriad military and non-military roles. The MRO exercise program is designed to test our plans, policies, and procedures for responding to a wide variety of possible contingencies, including cruise ships, passenger vessels (foreign and domestic flagged), gaming vessels, casino/dinner cruise vessels, passenger ferries, private and commercial passenger aircraft, transoceanic passenger aircraft, and all man-made, natural disasters, military and non-military scenarios.

The rapid growth in industry regarding the number and passenger capacity of all vessels including passenger aircraft only increases the likelihood of SAR incidents with large numbers of persons in the water. Additionally, natural disasters, such as floods and hurricanes, cause similar concern. Such incidents can occur in intercoastal waterways, close coastal waters (harbors and along the coast), territorial waters, or in international waters (out at sea). Initial

response often includes both a Sector and MSO and it may be appropriate to implement ICS. However, there are situations that are purely SAR, which may quickly evolve from a rescue to a recovery operation that is not SAR.

To maintain effective MRO capabilities response systems, notifications and response procedures should be exercised. While many procedures are employed daily in response to CG unit caseloads, many equally important procedures are employed far less frequently. These procedures, including response to hazardous substance incidents and intermodal (involving more than one mode of transportation) incidents such as commercial aircraft crashes and bridge allisions (vessels striking bridges), should be considered as possible scenarios. These scenarios are not all inclusive, but shown as examples. Contingency exercises of other MRO scenarios such as ones that could be unique to your AOR should also be considered for preparedness, readiness, and response planning

1.5.3.1 Exercise Participation. District should include whenever and wherever possible Sectors, Air Stations, other military commands as well as pertinent state, local community partners, other governmental organizations, and volunteer organizations (non-governmental)..

1.5.3.2 Resource Augmentation. ***When planning and coordinating exercises, RCCs and Command Center's shall refer to their SARFAC listing and invite appropriate organizations.***

1.5.3.3 Conducting MRO Contingency Exercises. Districts (Sectors and RCCs) are required to conduct a discussion-based (Seminar, Workshop, Table Top (TTX) or Game) exercise to establish and maintain positive working relationships with counterpart agencies; the exercise should focus on assessing plans, policies, procedures, coordination, notification procedures, provisions as per established MOUs, and rescue operations. In addition, the above exercises may be conducted as preliminary actions for operations-based exercise preparations.

1.5.3.4 Frequency of MRO Exercises. ***MRO Exercises shall be conducted in accordance with the Contingency Preparedness Planning Manual Volume I: Planning Doctrine and Policy, COMDTINST M3010.11(series) and Coast Guard Mass Rescue Operations (MRO) Program, COMDTINST 16711.2 (series).*** At a minimum, Districts should conduct and/or participate in one discussion based (e.g. seminar, workshop, game, or tabletop) and one operations based (e.g. drills, functional, full scale) MRO exercise over a five year period. Any actual major incident involving a MRO can be credited as an MRO major exercise.

1.5.3.5 Exercise Planning Guidance and Sharing Lessons Learned. Contingency Preparedness Planning Manual Volume III – Exercises, COMDTINST M3010.13 (series), provides guidance on how to plan and conduct an exercise, as well as reporting requirements for lessons learned. In addition**,** the Coast Guard Contingency Preparedness System (CPS) provides an efficient means of entering, integrating, managing, and monitoring Contingency Plans, Concept of Exercise reports, and capturing After Action Reports, Lessons Learned, and Best Practices from operations, contingency responses, and exercises. It can be found at http://llintra.comdt.uscg.mil/CPS/.

1.5.4 Information Sharing and Case Coordination

Coast Guard units will extend the maximum practicable cooperation to federal, state, local and private agencies in the prosecution of SAR missions.

1.5.4.1 ***The SAR Coordinator of any Coast Guard unit responding to a recreational boating accident (as described in 33 CFR 173.55) occurring within concurrent state jurisdiction shall notify the responsible state authorities as soon as practical to ensure inclusion of the information in the state Boating Accident Report Database (BARD) system.***

1.5.4.2 Coast Guard units receiving a request for SAR case information from a federal, state or local agency within their AOR will comply with that request unless there is a compelling reason to withhold it. Before the request is denied, concurrence will be obtained from the district commander.

1.5.4.3 ***Coast Guard commands, at all levels, shall establish sound working relationships with counterpart agencies within their AOR.*** Such relationships may take the form of formal agreements or MOUs. MOUs should be regularly reviewed for currency. ***This working relationship with other federal, state and local agencies must include timely and effective means of sharing SAR case information, as well as mission resources.*** This information is essential to these agencies to optimize their SAR case contribution, and for their investigative purposes, which ultimately benefit the Coast Guard.

1.5.5 SAR Assessments

A SAR assessment is intended to identify areas for improvement and to help assess needs of the SAR system.

1.5.5.1 The Coast Guard conducts two general types of assessment: internal and international. The internal (national) assessment is an evaluation of our national system as performed within the Coast Guard. Coast Guard personnel trained for this duty perform such assessments at a specific level (unit or RCC).

1.5.5.2 International SAR assessments are conducted by the U.S. Coast Guard at the request of a foreign government. Such requests from a foreign government may come directly to Coast Guard Headquarters SAR Program (CG-SAR) or may come indirectly; e.g., through another U.S. agency, from IMO in accordance with an existing MOU, or to another part within the Coast Guard. An international SAR assessment is typically an evaluation of that country's overall SAR service. There are few people in the Coast Guard with experience in conducting this type of assessment.

1.5.5.3 ***All requests for an international SAR assessment shall be brought to the attention of Commandant (CG-SAR)***. ***Such assessments shall be conducted under the guidance provided in Reference (b), Volume I, Chapter 5, which provides broad guidance and Appendix H, National Self-Assessment on Search and Rescue, which is a general questionnaire on arrangements to develop and provide SAR services.***

1.5.5.4 The U.S. SAR system has served as a model for many countries but should not be viewed as the exclusive way of providing SAR services. Any country requesting U.S. Coast Guard assistance in assessing its SAR system will be encouraged to complete the *National Self-Assessment on Search and Rescue* questionnaire contained in Volume I of the IAMSAR Manual before an on-site visit is conducted. The country will also be encouraged to provide

an advance copy of the completed questionnaire since this document is very useful in preparing for the visit.

1.5.6 Sharing Computer SAR Applications

The authority to distribute SAR computer tools varies by application and agency and is different for domestic and foreign agencies as well as federal, state and local. These agencies desire to use the software for SAR coordination/planning and other emergency response operations. It is consistent with the SAR Program's goal to be a leader in SAR to promote using the best tools available for all SAR agencies (domestic and foreign). ***All requests for sharing SAR software must be approved by Coast Guard headquarters.*** Commandant (CG-SAR) is the point of contact.

1.5.6.1 Use of SAROPS by Domestic and Foreign agencies. SAROPS and associated SAR planning applications require a high level of competency to be effective. More importantly, SAROPS relies on the SAR Controller to fully understand certain assumptions that are made in the processing. Without proper training an operator can easily develop incorrect search plans that can result in the loss of life. It is essential that all users of SAROPS participate in a SAR Training curriculum that provides planners the knowledge required to effectively prosecute a case using these applications.

1.5.6.2 Specific guidelines required for domestic state and local use of SAROPS: Consistent with the SAR leadership goal, the SAR Program supports the distribution of the SAROPS software to domestic agencies within the following specific guidelines.

(a) ***Domestic agencies requesting the software must have a sponsoring USCG command. Request shall be made via the sponsoring command and must receive positive endorsement via the chain of command for final approval by the Office of Search and Rescue (CG-SAR).***

(b) The sponsoring command will provide assistance as needed to ensure the domestic agency has the necessary knowledge/skills to properly use SAROPS. Training via the National SAR School (either resident or exportable course) cannot be offered due to the overwhelming need within the USCG for these quotas. Any training would necessarily be provided locally by the sponsoring command. Sponsoring commands are limited to those that receive formal SAR School training (Sectors & Districts).

(c) Domestic agencies having problems with software should first be required to contact their sponsoring command. If the sponsoring command cannot resolve the problem then the use of the Hotline (1-757-686-2156) should be authorized. This use should be carefully monitored to ensure any costs are adequately covered.

(d) SAROPS/SAR Tools search planning software may be provided free of charge to domestic agencies. ***Domestic agencies are responsible for providing the necessary hardware, appropriate ArcGIS license and if desired must provide their own environmental data source.***

(e) Sponsoring commands should coordinate with C3CEN for delivery and loading of software. If C3CEN is required to assist in the setup of SAROPS for an agency, the agency may be required to bear any associated cost. When the software is loaded, the sponsoring command will work with C3CEN to ensure the agency information is properly

documented for the C3CEN distribution list and software is receipted for by the agency.

1.5.6.3 Specific guidelines required for other federal agencies use of SAROPS. SAROPS/SAR Tools are Government off the Shelf (GOTS) applications. Requests for SAROPS may be made to Commandant, (CG-SAR).

1.5.6.4 Specific guidelines required for foreign use of SAROPS. SAROPS is available to international SAR authorities. ***International SAR authorities will be responsible for providing the necessary hardware, appropriate ArcGIS license and if desired must provide or contract for their own environmental data source. When approved, international SAR authorities must make all requests for SAROPS to Commandant (CG-DCO-I).***

1.5.6.5 Specific guidelines for domestic and foreign use of other SAR applications: Use of other SAR application will be on a case-by-case basis. These requests should be forwarded to the Commandant, (CG-SAR).

Section 1.6
SAR Agreements

SAR agreements shall conform to requirements stipulated in the National SAR Plan, Appendix A in Reference (a), other pertinent agreements, and the guidance of superiors in the chain of command.

1.6.1 International SAR Agreements.

1.6.1.1 There are two types of international SAR agreements: formal international SAR agreements and informal non-binding international arrangements (e.g., memoranda of understanding). The United States is party to numerous international instruments (treaties, conventions, and agreements) to promote cooperation with other countries in rendering assistance to persons in distress. Some federal agencies have similar plans, agreements, and procedures for coordinating SAR efforts.

1.6.1.2 The United States, in support of Coast Guard search and rescue responsibilities, seeks to enter aeronautical and maritime SAR agreements where appropriate with other countries. International SAR Agreements can only be negotiated by Commandant (CG-SAR). While field commands are not authorized to unilaterally negotiate and conclude SAR agreements with other countries, they should identify any needed agreements and notify Commandant (CG-SAR) with the appropriate information**.**

1.6.2 Domestic and Local SAR Agreements

1.6.2.1 SAR Coordinators (District Commanders) are authorized to enter into domestic SAR agreements by the National SAR Plan. ***SAR Coordinators need no specific approval from Commandant, but shall comply with requirements prescribed by the Area SAR Coordinator (Area Commander) and References (l) and (m).***

1.6.2.2 SAR agreements should resolve local coordination problems. Local agreements should not include or repeat issues dealt with adequately in the National SAR Plan or agreements executed by senior commands. Local agreements are appropriate when certain local responsibilities need to be more clearly defined or contingency plans need elaboration. SAR agreements are not needed if SAR issues can be readily resolved by informal coordination.

1.6.2.3 Local operational commands are best able to recognize the need for SAR agreements and should contact their District Chief of Incident Management for guidance. As such, District Commanders should encourage commands to call attention to issues that may require stronger commitments than local informal coordination can provide.

1.6.2.4 When necessary and possible, SAR agreements with states should be included in the Federal/State Recreational Boating Safety Cooperative Agreements (BSCA) as authorized by 46 USC Chapter 131. More comprehensive maritime SAR agreements may be needed with territories whose land areas are also within the Coast Guard SAR Coordinator's area of responsibility such as Puerto Rico, the Virgin Islands, and Guam. Refer to References (l) and (m) for instruction on instituting cooperative agreements.

1.6.2.5 ***One copy of all SAR agreements, except those included in the BSCA, shall be sent to Commandant (CG-SAR).*** Area and District Commanders may prescribe additional requirements for distributing agreements made by subordinate commands.

1.6.2.6 ***Agreements must include provisions for canceling and amending.*** A typical provision for cancellation is six months written notice by one party. ***Agreements shall be reviewed annually to ensure relevance.*** Unnecessary agreements should be cancelled and Commandant (CG-SAR) advised.

1.6.3 Department of Defense (DOD) SAR Agreements.

DOD facilities can be used under the National SAR Plan for civil SAR. Reference (a) provides guidance on availability of resources from each of the DOD components.

1.6.3.1 SAR Coordinators should be cognizant of all DOD resources regularly available for SAR response within their SRR. Where DOD resources are key components of the SAR System, agreements detailing response parameters and expectations should be established.

1.6.3.2 When Coast Guard resources are assisting DOD facilities with SAR for their forces, the Coast Guard may be designated as SMC to coordinate SAR operations; SMC assignment should be discussed and agreed on with the DOD component being assisted.

1.6.3.3 Coast Guard SMC case termination/suspension decisions will be independent of those of the DOD SMC (if separately assigned). A single SMC is preferred for effective use of resources and to minimize confusion.

1.6.3.4 ***Coast Guard SAR response to an incident involving DOD assets shall not be delayed to determine who is to be assigned as SMC. A Coast Guard response shall be initiated immediately (within current distress response guidelines) upon notification of a distress incident involving DOD forces; SMC discussions should take place in parallel. Coast Guard resources shall continue until positively released by the SMC, either Coast Guard or DOD.***

Section 1.7
International SAR

1.7.1 SAR in Foreign Territories.

1.7.1.1 Relations with foreign countries and the protection of U.S. citizens abroad are primarily the responsibility of the U.S. Department of State (DOS), which has no SAR facilities. When DOS requires SAR facilities, Foreign Service Posts (FSPs; e.g., embassies, consulates) depend on facilities of the resident country, the Coast Guard, and other U.S. agencies.

1.7.2 Guidance for Incidents Concerning U.S. Craft or Citizen Missing, in Distress in Foreign Territory or Territorial Seas.

1.7.2.1 ***When information is received that a U. S. air or surface craft, or a craft with U.S. citizens aboard, is in distress or missing while in or over a coastal State's territory or territorial seas, Area and District Commanders shall***:

(a) Determine via SAR communications channels (including commercial and Air Traffic Service facilities) the action taken and planned by responsible coastal State SAR authorities to respond within their territory;

(b) If Coast Guard rescue assets are conducting an AE rescue operation, notify the coastal State authorities;

(c) If the source of information is other than a U.S. FSP:

(1) Contact the appropriate U.S. FSP(s) by the most direct means;

(2) Pass to the FSP all pertinent information;

(3) Request the FSP immediately implement procedures for U.S. citizens in distress; and

(4) Recommend any appropriate additional measures, particularly in cases of overdue surface craft (Note: Area and District Commanders or their SAR Mission Coordinator (SMC), as appropriate, have authority to communicate with U.S. FSPs concerning the prosecution of SAR incidents, but must keep Commandant and DOS informed.).

(d) If the original source of information is a U.S. FSP, assist in evaluating the incident and recommend appropriate SAR action;

(e) Dispatch SAR assets when one of the following applies:

(1) A coastal State's SAR authorities request, or grant permission for U.S. SAR assistance (notify the appropriate FSP(s); no further clearance is required);

(2) The Area or District Commander or their SMC decides that U.S. assistance should be provided:

(a) If the case involves the conduct of an AE rescue operation by Coast Guard rescue units, notify the foreign government; or

(b) For SAR operations not involving the conduct of an AE rescue operation, obtain consent from the coastal State to assist in the conduct of a SAR operation (notify

the FSP).

(3) A U.S. FSP requests, or the Commandant directs, the dispatch of Coast Guard units, and advises that clearance has been obtained.

(f) Retain operational control of U.S. efforts unless it is operationally advantageous to pass control to another SMC, or it is in accordance with an applicable SAR agreement or standard international practice;

(g) Throughout the incident, keep Commandant advised in case additional diplomatic efforts become necessary.

(1) Notify the Coast Guard National Command Center; and

(2) ***SITREPS shall be submitted with DOS as an information addressee (Note: Notification of the U.S. FSP is not a substitute for notification to DOS).***

(h) Ensure the original information source remains advised of the SAR operation.

1.7.3 Supplemental guidance for Coast Guard RCCs.

Generally, U.S. SAR operations within the jurisdiction of a coastal State should be in accordance with that country's requirements and applicable SAR agreements. Exceptions include the conduct of AE rescue operations. Within certain limitations, each coastal State has the sovereign right to control access to its territory, territorial seas and the airspace over these areas.

1.7.4 Amver System.

Amver is a worldwide voluntary ship reporting system for SAR sponsored by the U.S. Coast Guard. Amver's primary function is to quickly provide SAR authorities with accurate position information and characteristics of ships near a reported maritime or aviation distress that may be able to provide assistance. Vessels of all nations, on coastal or oceanic voyages, anywhere in the world, are encouraged to participate by reporting their position to Amver. Amver-participating vessels are typically merchant vessels, but can also include mega-yachts, commercial fishing vessels, or any other vessel capable of providing assistance. Vessels participate by sending movement reports (e.g., sailing plan, periodic position updates, and final report) to the Amver Center at OSC via assigned coast or international radio stations or satellite service providers. Information from these reports is entered into a database that computes dead reckoning positions for vessels anywhere in the world while they are participating in the system. Vessel characteristics valuable for determining SAR capability from other available sources of information will be accessed through Amver.

1.7.4.1 Position information and ship SAR characteristics within the area of interest are made available to recognized SAR authorities of any nation for use during a SAR case.

1.7.4.2 Because vessel movement information provided to Amver is considered proprietary commercial or financial information, it should be carefully guarded from external release and handled in accordance with the specific guidelines in Reference (k) and Reference (n). Predicted locations or Amver information are disclosed only for safety purposes; it should not be provided to Coast Guard personnel in other mission areas (e.g., law enforcement, maritime investigations) nor other types of agencies. Search planning policy and procedures using Amver are discussed in Chapter 3 of this Addendum.

1.7.4.3 Deciding when to request an Amver-participating vessel or other vessel divert in response to a SAR operation is the responsibility of the SMC, based on careful consideration of all available information. However, it should be remembered that commercial vessels participate voluntarily in Amver, are usually on tight logistical schedules, and diversions for SAR can be costly for shipping companies.

1.7.4.4 Amver-participating vessels should be called upon to assist whenever necessary to respond to a life threatening situation. They may be used along their track to help verify distress information and to keep a lookout.

1.7.4.5 Use of Amver-participating vessels to assist in extended searches should be weighed against use of other available resources. Divert as many vessels as are required, but release ships as soon as possible, consistent with the situation and their apparent importance to the SAR operation.

1.7.4.6 SOLAS ships may be asked to serve as the OSC or to perform other functions in accordance with *IAMSAR Manual, Volume III, Mobile Facilities*. While ships are valuable rescue facilities, they should be used sparingly for extended searches due to their relatively low speeds, small sweep widths, and high costs involved. Aircraft are preferred search facilities when available, but ships may be asked to search as warranted in the judgment of the SMC. Regulation V/33 of the SOLAS Convention, in part, states "The master of a ship at sea which is in a position to be able to provide assistance, on receiving a signal from any source that persons are in distress at sea, is bound to proceed with all speed to their assistance…" However, use of Amver allows the SMC to select the best facility(s) and allow the other vessels to proceed without diverting.

1.7.4.7 Reporting usage of the Amver system by the RCC will ensure continued Coast Guard provision of Amver services and also encourage participation by commercial vessels. ***SAR SITREPs and District/Area Operations Summaries shall be sent to Amver Maritime Relations (message PLAD "COGARD AMR NEW YORK NY" or by e-mail) whenever an Amver-participating vessel makes a rescue (including number of persons rescued) or diverts to assist (with or without positive results), or a foreign RCC requests a SURPIC.*** This information will be compiled and reported in annual statistics for Coast Guard and public use. As feasible, the Coast Guard RCC should follow-up on foreign RCC requests for Amver information and report the outcomes as appropriate. The RCC should have procedures in place to quickly recognize any Amver-participating vessel that diverts or makes a rescue. Such recognition can be in the form of a thank you letter to the company/owner or a public service award for the vessel in an actual rescue.

Section 1.8
Assistance Entry (AE)

1.8.1 Assistance Entry (AE)

1.8.1.1 For as long as sailors have plied the seas, there has been an ancient code requiring mariners to aid others in distress. Long before the establishment of territorial seas, mariners have recognized a humanitarian duty to rescue others from distress at sea. Moreover, the duty to render assistance at sea has been stated in various international instruments for over 100 years. The *United Nations Convention on the Law of the Sea* (LOS Convention) gives expression to the tradition and duty of all seafarers to render assistance to persons in distress without regard to the location of a vessel in distress. Although the United States is not a party to the LOS Convention, it complies with the provisions related to navigation and over flight, as those provisions are reflective of customary international law. Article 98 of the LOS Convention, "Every State shall require the master of a ship flying its flag... to render assistance to any person *found at sea* in danger of being lost." (emphasis added). The broad understanding of the mariner's duty to render assistance includes the conduct of rescue operations within a coastal State's territorial sea and is incorporated into the Coast Guard's AE policy.

1.8.1.2 In addition to codifying the duty to render assistance to mariners in distress regardless of location under Article 98, the LOS Convention makes the act of stopping to render assistance to mariners in distress while transiting a foreign territorial sea fully consistent with the principles of innocent passage in Article 18, thus disassociating entry or rendering assistance while in innocent passage from the notion that these acts violate a coastal State's sovereignty.

1.8.1.3 International law recognizes and provides for the duty to save lives in danger or distress, even when they are within a coastal State's territorial sea. However, internationally recognized SAR duties must be balanced with international concerns for sovereignty of a coastal State and United States interests.

1.8.1.4 The conduct of SAR operations in a coastal State's territorial sea generally involves two principles:

(a) The sovereign right of nations to control and regulate entry into their territory; and

(b) Humanitarian need to quickly and effectively assist persons in distress without regard to nationality or circumstances.

1.8.1.5 The conduct of AE rescue operations in a coastal State's territorial sea does not require seeking or receiving permission of the coastal State.

1.8.1.6 Customary practice for aircraft conducting AE rescue operations in a coastal State's territorial sea is not as fully developed as for vessels (e.g., nations may recognize the right to conduct AE rescue operations more readily for vessels than for aircraft). In addition, the conduct of AE rescue operations by nonmilitary vessels is apt to cause less coastal State concern than entry by military vessels. Therefore, safety of the rescue unit must be considered in light of the views of the coastal State whose territorial sea or overlying airspace is being entered.

1.8.1.7 Ships and aircraft of other coastal States should be afforded comparable freedom to enter U.S. territorial seas. U.S. actions that unreasonably restrict entry will inevitably jeopardize the ability of U.S. vessels and aircraft to conduct AE rescue operations in another coastal State's territorial sea.

1.8.2 Coast Guard Assistance Entry Policy

1.8.2.1 Coast Guard rescue assets are authorized to enter a coastal State's territorial sea to rescue persons in distress; such assistance is to be provided without regard to the nationality or status of such persons or the circumstances in which they are found.

1.8.2.2 When a Coast Guard rescue asset can render or arrange assistance to persons in distress within a coastal State's territorial sea, it should do so in accordance with the following policy and information**.** The Coast Guard's goal, when operational units contemplate AE rescue operations, is to balance concerns for saving lives with coastal State sovereignty and national security concerns. As such, the conduct of AE rescue operations must consider:

(a) The safety of assisting personnel;

(b) The safety of the persons in danger or distress;

(c) U. S. foreign relations with the coastal State; and

(d) Any applicable international SAR agreement.

1.8.2.3 Coast Guard personnel should refer to vessels or aircraft, including military craft, which enter into or over fly a coastal State's territorial sea to render emergency assistance to persons, ships or aircraft in distress, as "assistance entry" (AE) (Note: DOD commands use the term "right of assistance entry (RAE)" for such operations.).

1.8.2.4 Coast Guard Rescue Surface Assets. Coast Guard rescue surface assets may conduct an AE rescue operation in a coastal State's territorial sea, when in the judgment of the unit or operational commander:

(a) There is reasonable certainty (based on the best available information regardless of source) that a person is in distress;

(b) The distress location is reasonably well known; and

(c) The surface asset is in position to render timely and effective assistance.

> Note: Coast Guard surface assets are authorized to use Coast Guard aircraft in the conduct of coordinated AE rescue operations.

1.8.2.5 Coast Guard Rescue Aircraft. Coast Guard rescue aircraft may conduct an AE rescue operation in a coastal State's territorial sea, when in the judgment of the aircraft commander:

(a) There is reasonable certainty (based on the best available information regardless of source) that a person is in distress;

(b) The distress location is reasonably well known; and

(c) The rescue unit is in a position to render timely and effective assistance.

1.8.2.6 ***Coast Guard rescue assets shall NOT conduct AE rescue operations under any of the following conditions:***

(a) ***To perform a search (AE rescue operations in a coastal State's territorial sea extends only to rescue operations not searches. Coastal State permission must be obtained prior to entering into, flying over or landing in territory or territorial sea of a coastal State for search operations unless other prior arrangements have been made. This can sometimes be arranged with an RCC of that coastal State.);***

(b) ***To rescue (or salvage) property (other than in limited cases, such as for the retrieval of medical supplies, or other property that may assist in the conduct of the lifesaving operation);***

(c) ***To assist persons not in distress; or***

(d) ***Within the internal waters or over the land mass of a coastal State.***

1.8.2.7 ***For all AE rescue operations conducted by Coast Guard rescue units, the Coast Guard National Command Center shall be promptly notified.***

1.8.2.8 Normally, the Coast Guard should refrain from conducting an AE rescue operation when other rescue units, capable of rendering timely and suitable assistance are known to be on scene or en route, unless there is good reason to believe that the other rescue units cannot or will not respond in an adequate or timely manner.

1.8.2.9 ***When conducting an AE rescue operation, permission of the coastal State shall NOT be requested and the following shall apply***:

(a) ***The coastal State shall be notified of the entry of a Coast Guard rescue unit(s) into their territorial sea at the earliest opportunity, both as a matter of courtesy and so its rescue units may be activated if necessary; and***

(b) ***Operational communications shall avoid implying that permission is being requested; however, in recognizing the sovereignty of the coastal State communications shall be carefully worded to foster cooperation in the rescue effort.***

1.8.2.10 Reasonable doubt as to the immediacy or severity of a situation shall be resolved by assuming the person is in distress.

1.8.2.11 If the coastal State objects to the presence of the Coast Guard rescue asset while in the conduct of an AE rescue operation, or if its military/police units attempt to interfere with or otherwise disrupt Coast Guard rescue unit efforts, attempts should be made to arrange alternative assistance to those in distress, resolve disagreements amicably on scene, convince the coastal State and its units of the humanitarian nature of the situation, and advise them of Coast Guard intentions. If such opposition, interference or disruption:

(a) Ceases, the Coast Guard rescue asset may proceed with the AE rescue operation; or

(b) Continues, and the distress appears life-threatening, the Coast Guard rescue asset should, when possible, await direction via the operational chain of command, but may proceed to render immediate assistance.

1.8.2.12 When deciding what actions to take when a coastal State objects to the conduct of an AE rescue operation, the operational or unit commander must weigh the risk to the person(s) in

distress, including potential for other assistance, the apparent seriousness of the coastal State's communicated opposition, and its potential enforcement capability.

1.8.2.13 ***The right of self-defense applies in the conduct of an AE rescue operation and the following shall apply:***

(a) ***For Coast Guard rescue assets assisting on scene, the right of self-defense shall extend to and include persons, vessels, or aircraft being assisted and/or escorted;***

(b) ***The right of self-defense shall not include protecting the assisted persons (unless aboard the Coast Guard unit), vessels, or aircraft from legitimate law enforcement efforts conducted by a coastal State; and***

(c) ***Use of force, as detailed in Reference (o) and applicable Rules of Engagement, provide more detailed information and procedures.***

1.8.2.14 During the conduct of an AE rescue operation, it may be useful for the Coast Guard rescue asset to make SECURITE broadcasts when entering into or over a coastal State's territorial sea.

1.8.2.15 ***A coastal State shall be notified of actual or potential marine pollution associated with a possible rescue operation in their respective territorial sea.***

1.8.2.16 ***Area and District Commanders shall***:

(a) ***Ensure operational commanders, RCC watchstanders, and Coast Guard rescue units understand and adhere to Coast Guard policy in the conduct of AE rescue operations into or over a coastal State's territorial sea;***

(b) ***Establish procedures for timely notification of the Coast Guard National Command Center of the conduct of an AE rescue operation;***

(c) ***Upon becoming aware of persons in distress in a coastal State's territorial sea, authorize Coast Guard rescue units to conduct an AE rescue operation, as required;***

(d) ***If available, arrange appropriate assistance, including assistance from the coastal State, consistent with the immediacy and severity of the situation.***

(e) ***Ensure during the conduct of an AE rescue operation, the Coast Guard rescue asset follows standard Coast Guard rescue practices and procedures;***

(f) ***Alert the coastal State of potential marine pollution associated with an AE rescue operation:***

(1) ***For rescue operations involving vessels carrying oil or hazardous chemicals off the coast of Canada or Mexico, ensure that notification is made to that coastal State, including alerting the coastal State's pollution incident On Scene Coordinator (OSC) under the appropriate Joint Contingency Plan; and***

(2) ***Notification should be coordinated with the cognizant U. S. pre-designated Federal on Scene Coordinator (FOSC).***

(g) ***Direct Coast Guard rescue asset in the conduct of AE rescue operation to proceed to the scene, render appropriate assistance, and depart as soon as possible;***

(h) ***Advise the coastal State of the situation and intentions, or broadcast in the blind if***

communications cannot be established;

(i) ***Keep any involved RCC informed;***

(j) ***Continue to monitor the situation;***

(k) ***Document communications with any FSP; include Commandant, DOS and the American Embassy of the affected coastal State as an information addressee;***

(l) ***Develop and issue appropriate subordinate directives to ensure accurate implementation of this AE policy, including guidance on:***

(1) ***The conduct of AE rescue operations in a coastal State's territorial sea;***

(2) ***Establishing procedures to provide ships and aircraft of other nations comparable support in the conduct of reciprocal AE rescue operations in the U.S. territorial sea; and***

(3) ***Information concerning communications, including:***

a. ***Maintain communications by the most rapid means, followed by an immediate precedence action message providing information on the conduct of the AE rescue operation to the National Command Center, Joint Chiefs of Staff (JCS), other Area and District Commanders, DOS, the American Embassy in the coastal State, and the National Military Command Center (NMCC); and***

b. ***After initial interagency coordination, subsequent action SITREPs should be addressed to the appropriate operational commander, with information to Commandant (CG-DCO).***

(m) ***Notify the Coast Guard National Command Center concerning:***

(1) ***The conduct of an AE rescue operation by Coast Guard rescue units;***

(2) ***If a coastal State objects to a Coast Guard rescue asset conducting an AE rescue operation within their territorial sea, interferes with, or otherwise disrupts such entry;***

(3) ***If the coastal State ceases to object to such entry, or ceases to interfere with or otherwise disrupt the Coast Guard rescue asset's conduct of an AE rescue operation.***

(4) ***If military or police units of a coastal State attempt to interfere with or otherwise disrupt a Coast Guard rescue asset carrying out an AE rescue operation;***

(5) ***If a Coast Guard rescue asset is exercising, or is likely to exercise, the right of self-defense in or over a coastal State's territorial sea in the conduct of an AE rescue operation; and***

(6) ***If a Coast Guard rescue asset will continue in the conduct of an AE rescue operation for a person in distress in a coastal State's territorial sea after the coastal State has objected to entry.***

(n) ***Communication to the Coast Guard National Command Center shall be by the most rapid means, followed by an immediate precedence message, with JCS, other Area and District Commanders, DOS, the American Embassy in the coastal nation, and the NMCC included as information addressees***.

1.8.2.17 ***Coast Guard unit commanders, upon becoming aware a person in distress in a coastal State's territorial sea, shall:***

(a) ***When notified of a person in distress, advise their operational commander via the most expeditious means consistent with the immediacy and severity of the situation, their position, on scene endurance and intentions;***

(b) ***Determine the position, vessel description, nature of problem, person(s) on board, survival gear, on scene conditions, potential for marine pollution, etc.;***

(c) ***As circumstances dictate, conduct an AE rescue operation, or attempt to arrange assistance;***

(d) ***Establish and maintain communications with those in distress, and with the coastal State as directed by the operational chain of command; and***

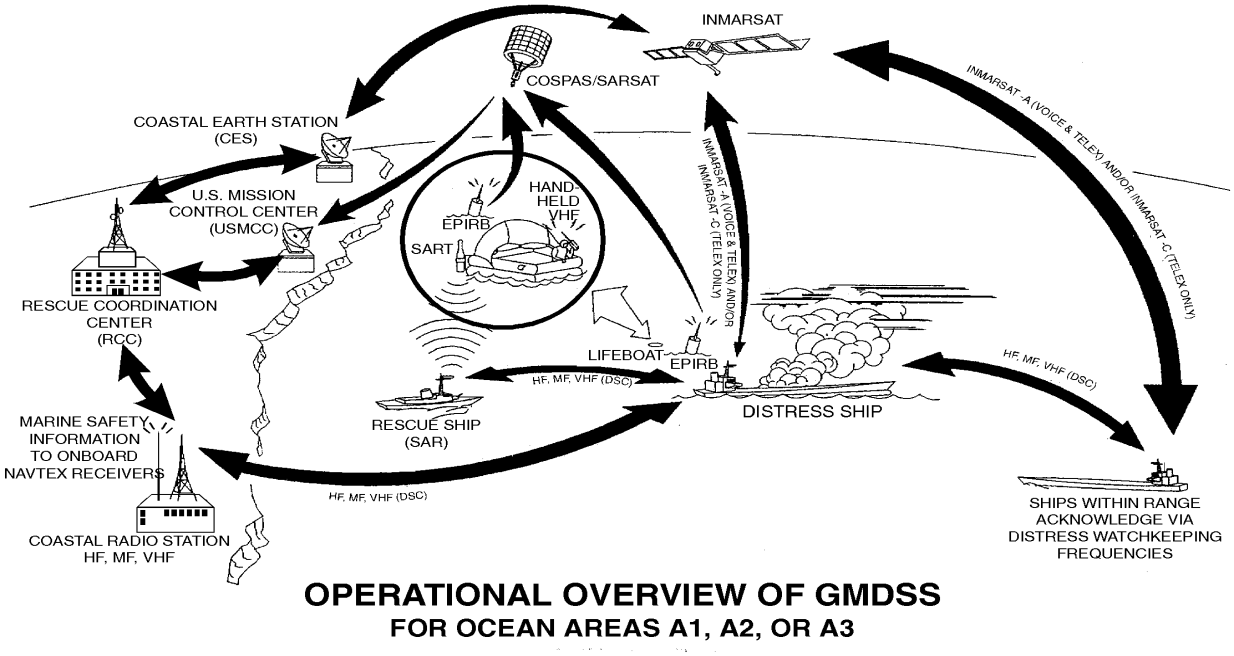
(e) ***Relay the distress information to the appropriate RCC.***

CHAPTER 2
SAR COMMUNICATIONS

Section 2.1
Global Maritime Distress and Safety System (GMDSS) and Other Satellite Notification Systems

2.1.1 Introduction

The Global Maritime Distress and Safety System (GMDSS) is an internationally established distress and safety system. GMDSS was established by the International Maritime Organization (IMO) in 1988, and GMDSS equipment carriage requirements are now mandatory for vessels subject to the Safety of Life at Sea (SOLAS) Convention. GMDSS also can benefit all maritime interests. GMDSS relies upon the establishment of specific "sea areas" of communications and multiple distress alerting and communications networks and methods. This improvement in ship-to-shore distress alerting requires particular equipment on board vessels and at Coast Guard RCCs, Sectors, and Communications Area Master Stations (CAMS) in order to send and receive alerts. The primary purpose of GMDSS was to change from a ship-to-ship method of distress alerting to a ship-to-shore method. It provides for the automatic identification of the caller and the location of a vessel in distress. GMDSS became fully effective for the signatory nations of the SOLAS convention on 1 February 1999.



OPERATIONAL OVERVIEW OF GMDSS
FOR OCEAN AREAS A1, A2, OR A3

Figure 2-1 Operational Overview of GMDSS

GMDSS is the umbrella of internationally approved distress telecommunications systems. INMARSAT and 406 MHz EPIRBs are the internationally recognized methods of satellite distress alerting under GMDSS. Digital Selective Calling (DSC) is the internationally

recognized method of sending a terrestrial digital distress alert. For mariners not equipped with INMARSAT, EPIRBs, or DSC, use of traditional HF/MF/VHF-FM distress voice channels is the preferred method of distress alerting.

2.1.2 GMDSS Functions

GMDSS has 9 specific functions which SOLAS ships must be capable of performing.

2.1.2.1 **Transmitting** ship-to-shore distress alerts by at least two independent and separate means.

2.1.2.2 **Receiving** shore-to-ship distress alerts.

2.1.2.3 **Transmitting and receiving** ship-to-ship distress alerts.

2.1.2.4 **Transmitting and receiving** search and rescue (SAR) coordination communications.

2.1.2.5 **Transmitting and receiving** on scene communications.

2.1.2.6 **Transmitting and receiving** locating signals (EPIRBS/ELTs).

2.1.2.7 **Transmitting and receiving** maritime safety information (MSI).

2.1.2.8 **Transmitting and receiving** general radio communications (ship/ship, ship/shore and shore/ship).

2.1.2.9 **Transmitting and receiving** bridge-to-bridge communications.

2.1.3 GMDSS Coverage Areas

GMDSS divides the world's oceans into four "sea areas." SOLAS ships have distinct equipment carriage requirements for each area through which they transit.

2.1.3.1 **SEA AREA A1:** (VHF-FM range) An area within the radiotelephone coverage of at least one VHF coast station in which continuous DSC alerting is available as defined by the International Maritime Organization. Sea Area A1 will be implemented in the U.S. upon full completion of the Rescue 21 system.

2.1.3.2 **SEA AREA A2:** (MF range) An area, excluding sea area A1, within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is available as defined by the International Maritime Organization.

2.1.3.3 **SEA AREA A3:** (HF & Inmarsat range) An area, excluding sea areas A1 and A2, within the coverage of an INMARSAT geostationary satellite in which continuous alerting is available.

2.1.3.4 **SEA AREA A4:** An area outside sea areas A1, A2 and A3.

2.1.4 GMDSS Sub-Systems

GMDSS consists of numerous telecommunications sub-systems, including:

2.1.4.1 **Digital Selective Calling (DSC):** for distress, urgency, safety, routine, ship's business, and test calling via HF/MF/VHF-FM.

2.1.4.2 **NAVTEX:** narrow-band direct-printing telegraphy for transmission of navigational and meteorological warnings and urgent information to ships on MF.

2.1.4.3 **SITOR:** Simplex Teletypewriter Over Radio for long-range ship-to-ship and ship-to-shore communications and transmissions of Maritime Safety Information (MSI).

2.1.4.4 Inmarsat C: for distress alerting via telex only, data communications and reception of MSI.

2.1.4.5 Radio-Telephone: for transmission via HF/MF/VHF-FM.

2.1.4.6 Satellite EPIRB: Satellite Emergency Position-Indicating Radio Beacon for distress alerting and locating survivors of distress incidents (406 MHz).

2.1.4.7 SART: Search and Rescue (radar) Transponder, for locating survival craft.

2.1.4.8 AIS-SART: Automatic Identification System-Search and Rescue Transmitter for locating survival craft.

2.1.5 Description of GMDSS Sub-Systems

2.1.5.1 Digital Selective Calling (DSC) -- DSC is a IMO-specified technology intended to **initiate communications** over maritime radio and provide distress alert information to RCCs. DSC is similar to an electronic paging system: users of DSC may call a specific station or group of stations to establish communications. DSC calls are made using the applicable Maritime Mobile Service Identity (MMSI) number and appropriate DSC guard or calling frequencies, depending upon whether it is a distress alert or another type of call. The MMSI is the equivalent of the international radio call sign for establishing DSC communications. Federal Communication Commission (FCC) regulations require that all marine radio type accepted after 17 June 1999, have DSC capability. SOLAS convention regulated ships were required to outfit with DSC equipment as of 1 February 1999. Although DSC was intended to replace voice for initiating radio calls, the requirement for SOLAS class vessels to maintain a 24-hour continuous radio watch over VHF-FM channel 16 remains in effect. The requirement for SOLAS ships to guard 2182 KHz was abolished on 1 February 1999. ***However, because many vessels not required to comply with the SOLAS Convention continue to use 2182 kHz voice as a primary means of distress communications, Coast Guard cutters equipped with the capability to monitor 2182 kHz shall continue to do so at all times when underway.*** This mandate remains in effect until Sea Area A2 for the United States has been formally declared.

(a) DSC distress calls may also be electronically relayed to the Coast Guard by any vessel that has a DSC compatible radio, or by other DSC equipped RCCs. ***All DSC distress calls, and DSC distress relays, shall be acted upon according to the guidance provided in this chapter***.

(b) Detailed policy guidance for Coast Guard units equipped with DSC is provided in Section 2.2.4. In general, shore units receiving DSC distress alerts should first acknowledge receipt of the call via DSC and then attempt to establish voice communications on an appropriate channel. ***Afloat units must wait five minutes to allow the shore units to respond.*** If there is no response then respond to the call and relay the alert as soon as possible to the nearest Coast Guard shore unit. RCC personnel should attempt to identify the vessel, either through database sources or by contacting the appropriate foreign RCC based on the country code (first three digits) of the caller's MMSI. There are no restrictions on RCC personnel contacting foreign RCCs for the purposes of SAR case execution.

(c) DSC calls fall into the following categories: Distress, Urgency, Safety, and Routine. The most important information to be gleaned from an incoming DSC call is the category of call, the MMSI number, and (for distress calls) the position and nature of distress.

2.1.5.2 **NAVTEX** is a service specifically designed for the promulgation of Maritime Safety Information as a part of the GMDSS. All SOLAS-regulated ships were required to carry NAVTEX receivers on 1 February 1993. NAVTEX broadcasts are made by CG CAMS, COMMSTA Kodiak, Sector Guam and Sector San Juan.

(a) Coast Guard RCCs will use this broadcast method to alert ships in those coastal areas covered by NAVTEX to SAR and SAR-related information. The International Ice Patrol will use this system as a means of disseminating ice bulletins and warning messages. Districts, Sectors and the CG NAVCEN will use this system as a means of disseminating notices to mariners.

(b) NAVTEX message drafters should be aware of specific formatting required to ensure messages reach the targeted area. NAVTEX messages are prepared in accordance with the Chapter 12 of the Aids to Navigation Manual – Administration, COMDTINST M16500.7 (series). Charts of NAVTEX service areas are available on the CG NAVCEN Internet site: http://www.navcen.uscg.gov/?pageName=NAVTEX .

2.1.5.3 **INMARSAT B and C distress alerts** are received via phone and email at LANTAREA and PACAREA command centers from the Santa Paula, CA coast earth station, or by relay from other RCCs. E-mails from TELENOR arrive on a standard form. "F-77 and FB-500 distress alerts may be received via phone at LANTAREA and PACAREA command centers from other coast earth stations or by relay from other RCCs. No-cost distress priority shore-to-ship calling is available for F-77 and, when implemented into the GMDSS, FB-500 as established by Inmarsat.

2.1.5.4 **INMARSAT C telex replies** to ships sending distress alert messages are sent using distress priority. Command Centers have access to a web page established and maintained by INMARSAT C provider, TELENOR. This web page allows the RCCs to send distress priority messages to the vessel, or vessels in the vicinity of the distressed vessel. ***If web or Internet access is not available, RCCs can fax the desired message TELENOR for broadcast. RCCs shall call the TELENOR operator to verify receipt of fax.*** INMARSAT C telex messages are prepared in accordance with guidance provided in Section 2.3 and Appendix C, Section 4.

2.1.5.5 **INMARSAT SafetyNET --** SafetyNET is a service of Inmarsat's Enhanced Group Call (EGC) system and was specifically designed for promulgation of Maritime Safety Information (MSI) as a part of GMDSS. The EGC system (technically a part of the INMARSAT-C system) provides an automatic, global method of broadcasting messages to all GMDSS-equipped vessels in both fixed and variable geographical areas or to predetermined groups of ships.

(a) ***Coast Guard RCCs shall disseminate and monitor search and rescue (SAR) distress related information using the INMARSAT SafetyNET system when the SAR case location is deemed to be outside the coverage of NAVTEX.*** In general, NAVTEX coverage extends to 200 NM off the coast. For specific coverage, charts of NAVTEX service areas are available on the CG NAVCEN Internet site: http://www.navcen.uscg.gov. The International Ice Patrol will disseminate ice warnings and International Ice Patrol bulletins to the appropriate NAVAREA using the SafetyNET system. Meteorological information is disseminated via SafetyNET by the National Weather Service and navigational information is disseminated by the National Geospatial Intelligence Agency (NGA). ***Coast Guard RCCs shall not disseminate routine meteorological and***

navigational information via SafetyNET. Meteorological and navigational information should be forwarded to the appropriate agency for dissemination.

(b) SafetyNET service is provided through TELENOR's web interface, and via voice operator in case of Internet failure, as described in Section 2.1.1.4(d). SafetyNET message drafters should be aware of specific formatting required to ensure messages reach the targeted area. SafetyNET Messages are prepared in accordance with guidance provided in Section 2.3 and Appendix C, Section 4. Charts of INMARSAT service areas are available on the CG NAVCEN Internet site: http://www.navcen.uscg.gov/images/marcomms/inmareas.gif

2.1.5.6 HF/MF/VHF-FM Radio Telephone -- HF, MF, and VHF-FM Radiotelephone are also components of GMDSS.

2.1.5.7 406 MHz EPIRBs/ELTs/PLBs-- a component of GMDSS-- are integrated into the COSPAS-SARSAT system, which is an international joint venture in satellite-aided search and rescue. The concept involves the use of multiple satellites in low, near-polar orbits (LEOs) and geo-stationary satellites (GEOs) "listening" for distress transmissions from emergency beacons. The signals received by the satellites are relayed to a network of COSPAS-SARSAT ground stations where the location of the emergency is determined by measuring the doppler shift induced by the satellite motion relative to the distress signal. The fact that an alert has been detected, along with its position, is then relayed by way of a national Mission Control Center (MCC) to an appropriate national RCC or to another international MCC for initiation of the SAR activities. While EPIRBs are the primary equipment providing SARSAT emergency notification in the maritime environment, both Emergency Locator Transmitters (ELTs) used aboard aircraft and Personal Locator Beacons (PLBs) function identically within the SARSAT system. PLBs became legal for use in the United States in 2003. Due to their relatively low commercial price, it is expected that recreational boaters will increasingly use them as a method of emergency signaling. Policy for Coast Guard response to a PLB beacon is identical to that for an EPIRB or ELT. ***RCCs shall provide feedback into the USMCC Incident History Database (IHDB) System for all beacon alerts received, within five days of the case conclusion via the following website:*** https://incidenthistory.noaa.gov/ihdb/ ***Additionally, RCCs shall include a summary of the case in the Additional Comments section of the web page.*** Usernames and passwords for the IHDB can be obtained for RCC personnel by contacting the SARSAT Liaison Officer at Commandant (CG-SAR).

2.1.5.8 Search and Rescue Transponder (SART) -- The SAR Transponder (SART) is used for locating survival craft in the 9 GHz frequency band (9200-9500 MHz). Unique signals (swept frequency) are generated for interpretation only after being triggered by ship or aircraft radar. Range of air is 40 nautical miles; surface is 10 nautical miles. An audible alarm or light is activated on the SART when a rescue ship or aircraft is within close range. Battery capacity should be at least 96 hours. The SART signal appears as a distinctive line of 12 equally spaced blips on a radar screen extending outward from the SART position along its line of bearing.

2.1.5.9 AIS Search and Rescue Transmitter (AIS-SART). The AIS-Search and Rescue Transmitter is a portable manual-deployment survivor locating device intended for use on life rafts or survival craft and is an alternative to a radar SART. AIS SARTs are also used for personal locator beacons and man-overboard devices. The type of device used and an indication whether the transmission was active, or a test is transmitted as a safety related (text) message. As with radar SARTs, AIS SARTs are not intended as distress alerting devices, but rather as

distress locating devices. The device sends updated position reports using a standard AIS class A position report. It has a built-in GNSS receiver.

2.1.6 Satellite Emergency Notification Devices (SENDs).

Though not part of GMDSS, SENDs devices also operate over satellite systems. These alerting devices are intended for individual use and can be easily confused with 406 MHz Personal Locator Beacons (PLBs). SENDs may be dedicated satellite emergency notification devices or include additional functions and features. Additional features are increasingly being offered by SENDs, such as sending preprogrammed messages and/or tracking via Google Earth. Some newer devices even offer two-way data communication via satellite. Distress alerts are typically sent to a central commercial emergency call center for initial screening. These call centers will liaison with the appropriate SAR responder to notify them of the distress. Command Centers are reminded that the devices may offer more services than just distress alerting, such as tracking or two way text messaging. Command Centers may be able to communicate directly with the person in distress, enabling them to outfit and send the most appropriate SAR asset. SENDs alerts must be carefully evaluated and responded to in accordance with normal SAR case evaluation procedures (Uncertainty, Alert, Distress).

Section 2.2
Digital Selective Calling (DSC)

2.2.1 DSC Guard Requirements

2.2.1.1 Coast Guard Shore Unit DSC Guard Requirements. Coast Guard CAMS will guard six DSC frequencies: 2187.5kHz, 4207.5kHz, 6312.0kHz, 8414.5kHz, 12577.0kHz, and 16804.5kHz. Coast Guard Sectors equipped with MF DSC will guard 2187.5kHz. When equipped, Sectors will also guard 156.525mHz (channel 70). DSC guard frequencies and their equivalent voice and SITOR frequencies are listed in Table 2.1.

Table 2-1 DSC Guard Frequencies, Associated Voice and SITOR Frequencies

DSC Guard Frequency	Voice Frequency	SITOR Frequency
156.525MHZ	156.8MHZ	N/A
2187.5 KHZ	2182 KHZ	2174.5KHZ
4207.5 KHZ	4125 KHZ	4177.5KHZ
6312.0 KHZ	6215 KHZ	6268KHZ
8414.5 KHZ	8291 KHZ	8376.5KHZ
12577.0 KHZ	12290 KHZ	12520KHZ
16804.5 KHZ	16420 KHZ	16695 KHZ

2.2.1.2 Coast Guard Cutter/Boat DSC Guard Requirements

(a) ***Coast Guard vessels underway or at anchor equipped with VHF-FM DSC radios shall guard DSC frequency 156.525 MHz (channel 70).***

(b) ***Coast Guard vessels underway or at anchor equipped with HF/MF DSC radios shall guard DSC frequency 2187.5 kHz.***

2.2.1.3 Canceling Alerts. The proper method for stations or ships to cancel a false distress alert they initiated is outlined below:

(a) Stop the transmission immediately (i.e. turn the transceiver “off” then “on” again);

(b) Send a “Distress Cancellation” message from the DSC radio (HF only);

(c) Switch to the associated voice frequency;

(d) Make an “all stations” broadcast on the corresponding voice frequency.

(e) The broadcast should indicate the name, call-sign, MMSI number, and that the station is canceling the false alert sent (quote distress text) with the local date and time.

Note:	Other communications specific DSC policy and procedures can be found in Chapter 12 of Reference (p).

2.2.2 HF/MF/VHF-FM DSC Distress Alert Response Policy: Coast Guard DSC Equipped Shore Units

2.2.2.1 Purpose. To provide operational shore units with policy guidance for responding to HF, MF and VHF-FM DSC distress alerts.

2.2.2.2 Coordination. DSC is unique in that distress communications are initiated by digital data bursts that are widely distributed, but all follow-up communications after initial acknowledgement are typically handled by voice. International Telecommunications Union (ITU) regulations require each unit that receives a DSC distress alert or distress relay to send an acknowledgment, even if other units are already known to have done so. As such, it is probable that multiple sectors, along with the appropriate communications area master station (CAMS), will receive and acknowledge the same MF DSC distress alert. It is also possible that the same distress alert may be received on both HF and MF bands. For these reasons, it is important that Coast Guard units communicate with one another and with the default SAR Mission Coordinator (SMC) (see 2.2.2.6) to ensure role clarity during DSC case execution.

2.2.2.3 Initial Action. ***All shore-based units that receive a DSC distress call or distress relay shall complete the following actions:***

(a) ***Acknowledge the distress alert or distress relay***.

(1) Distress Alerts - Use the DSC acknowledgement function (sent to "All Ships") before taking any further action. ***Acknowledgements shall be made via DSC on the same frequency on which the distress alert was received, and shall take place after one minute to allow for units with automated MF/HF/VHF-FM DSC to make calls on all MF/HF/VHF-FM frequencies, and in all cases within 2.75 minutes of receipt, in accordance with ITU regulations.*** Acknowledgement does not imply assumption of SMC by the acknowledging unit. Acknowledgement simply means that a shore unit has received the DSC call and the U. S. Coast Guard is responding to it.

(2) Distress Alerts on the Rescue 21 suite – At the R21 suite an alarm will sound when a DSC alert is received. Refer to the table below and Tab 3-7 of the R21 Desk Guide to determine the appropriate watchstander response to a DSC message.

Table 2-2 DSC Watchstander Response Guide

	GPS	**No GPS**
MMSI Registered	The watchstander acknowledges and follows policy (SAR Addendum Ch. 2.2)	The watchstander acknowledges and follows policy (SAR Addendum Ch. 2.2)
MMSI Not Registered	The watchstander acknowledges and follows policy (SAR Addendum Ch. 2.2)	Not Acknowledged

The watchstander that acknowledged the alert shall be responsible for executing the case or for passing the case to the responsible operations unit controller for execution. Refer to Reference (a) for additional information on DSC policy.

(3) Distress Relays – Shore ***units shall acknowledge all DSC distress relays as they are received***. ***The first DSC Distress Relay for a given case shall be acknowledged via DSC.*** Subsequent Distress Relays that are received that relate to the same case may be acknowledged in one of two ways: a Distress Relay Acknowledgement sent to the "Individual" relaying vessel, or a voice acknowledgement. ***All acknowledgements shall take place within 2.75 minutes of receipt.***

(b) ***Monitor the corresponding voice frequency. After acknowledging a DSC distress alert, each receiving unit shall monitor the corresponding voice frequency for at least 10-minutes, or until follow-up communications between the distressed vessel and the Coast Guard is established***.

(c) ***Notify SMC. Each receiving unit shall notify the appropriate default SMC as outlined in Section 2.2.2.6 ("SMC Determination").*** Such notification will take place concurrent with the 10-minute monitoring period mentioned above.

2.2.2.4 2182 KHz AM and 2182 KHz USB Incompatibility. ***If the distress alert or distress relay originates on 2182 kHz voice instead of 2187.5 kHz DSC, the ACKNOWLEDGEMENT shall be by voice on 2182 kHz USB. If the station does not answer, then the shore unit must change the mode of transmission to H3E (AM) and ACKNOWLEDGE using this mode.*** Older marine radios may not be able to "understand" USB transmissions – even if the shore unit can hear the transmission.

(a) The older MF/HF radios carried by recreational boaters are unable to copy 2182 kHz USB. The reason for this is that these older radios automatically revert to AM when the "2182" red DISTRESS button is depressed.

(b) In the event that a boater sends an AM DISTRESS, the USB radios used by the USCG will be able to copy the transmission. When the USCG responds using USB, the boater will be unable to copy the transmission.

(c) In the event the USCG receives a distress on 2182 kHz, and after responding using USB, if the USCG is unable to establish contact**, then change to AM mode and repeat the call**.

2.2.2.5 Primary Voice Responder

(a) ***For all HF DSC distress calls, the primary voice responder shall be the appropriate CAMS. For MF/VHF DSC calls where a position is known, the primary voice responder shall be the sector within whose AOR the distressed vessel is located. These units shall have the primary responsibility to initiate a voice response if the distressed vessel does not promptly come up on the corresponding voice frequency. The primary responder shall make a single callout to the vessel in distress on the appropriate voice frequency, using any available information included in the DSC alert to identify the vessel.*** This information may include the vessel's position, nature of distress, or MMSI number. ***If communications are established, the primary voice responder shall verify that a distress situation exists, verify the vessel's position if possible, and notify the appropriate default SMC as outlined in Section 2.2.2.6.***

(b) ***If the primary voice responder is unable to establish communications with the distressed vessel after making the voice callout and monitoring the voice frequency for five minutes, the primary responder shall send a single point DSC call to the distressed vessel's MMSI number, distress priority. Because some DSC radios are only equipped with one receiver, primary voice responders shall send the single point DSC call three times over a 30-second period, in case the operator is using the receiver for voice communications.***

(c) Failure to establish communications. ***If communications with the distressed vessel cannot be established by the primary voice responder after following the steps outlined above, notification of such shall be made to the default SMC.*** Only the SMC can make the determination that a DSC distress alert is a probable false alert.

(d) MF/VHF DSC distress calls with no position or invalid position. For MF/VHF DSC distress calls where no position information is known, and for calls where the position of the distressed vessel falls outside the AOR of any sector with DSC capability, the 10-minute monitoring period for all receiving units remains in effect. If no communications are heard from the distressed vessel, the SMC may direct a specific unit that received the alert to assume the primary voice responder function.

2.2.2.6 SMC Determination

(a) ***Areas shall be the default level for SMC for all HF DSC distress calls. CAMS shall notify (by telephone, with follow-up via fax or message) the Area Command Center upon the receipt of all HF (and MF) DSC distress calls.***

(b) ***Districts shall be the default level for SMC for all MF DSC distress calls. Sectors shall notify (by telephone, with follow-up via fax or message) their parent District Command Center upon receipt of all MF DSC distress calls.***

(c) ***Sectors shall be the default level for SMC for all VHF-FM distress calls.***

(d) As this policy intends Districts to be the default level for SMC for MF DSC distress cases, Area Command Centers should ensure that the appropriate district is notified whenever the area is informed of the receipt of an MF DSC distress call from its CAMS.

(e) ***In the small percentage of cases where it is determined by the CAMS that the same DSC distress alert has been received on both the HF and MF bands, they shall indicate this in their initial notification to their respective Area Command Center. In this situation, the Area and District Command Centers shall jointly determine SMC on a case-by-case basis.***

2.2.2.7 Delegation of SMC

(a) Areas may delegate SMC for HF DSC distress cases to no lower than the District level. Delegation should normally occur in those cases where the position of the distressed vessel is known.

(b) Area Command Centers should also ensure that the appropriate District is informed of the receipt of MF DSC calls reported by the CAMS.

(c) Districts may delegate MF DSC distress cases to no lower than the Sector level. Delegation should normally occur in those cases where the position of the distressed vessel

is known. For cases where voice communications have not been established, Districts should attempt to identify the vessel via the MMSI Database and other known database sources on behalf of the Sector.

2.2.2.8 SMC Responsibilities. ***DSC is an internationally recognized distress alerting system, and, as such, DSC initiated distress calls shall be immediately placed in the "distress" emergency phase.*** The first priorities of the SMC are to determine if communications have been established with the distressed vessel, and to plot the distressed vessel's position, if known. ***For DSC distress cases outside of the U.S. area of SAR responsibility, the default SMC shall transfer SMC to the appropriate foreign RCC. If communications are established, and the distressed vessel is in the SMC's AOR, the case shall be prosecuted according to existing SAR policies and procedures.*** For districts coordinating MF DSC cases, the district should determine which sector will handle voice communications with the distressed vessel, as multiple sectors may have received and acknowledged the initial MF DSC distress alert. Usually, the sector in whose AOR the distressed vessel is located should be tasked to coordinate follow-up communications. If communications cannot be established, the SMC should use the vessel's MMSI to query the MMSI Database within MISLE and/or the Maritime Mobile Access and Retrieval System (MARS) database located on the ITU's website. The MMSI number can be used with either database to help determine the vessel's identity and any other possible means of contacting the vessel (such as an Inmarsat number). Where no communications are possible, but a position is provided via DSC that is inside the SMC AOR, assets should be dispatched to investigate as soon as possible.

Note: The MMSI database within MISLE is updated on a weekly basis whereas the information contained within the ITU database may be older than one month.

2.2.2.9 Case Claiming. ***Units shall claim cases for DSC initiated distress calls according to the existing guidelines for cases in this Addendum.***

2.2.2.10 Case Suspension. ***DSC alerts shall be treated as all other alerts.*** See Chapter 3, Section 3.4.9 for uncorrelated distress broadcast & alert procedures. Normal SAR case suspension procedures apply for those DSC initiated distress cases where:

(a) no communications with the distressed vessel can be established;

(b) no further information or means of contacting the vessel can be obtained from either database sources or other sources; and

(c) no position information is known.

2.2.2.11 Procedures for Non-Distress DSC Calls. Non-distress category DSC calls (Urgency, Safety, Routine, and Ship's Business) should be acknowledged if requested by the originator. "Test" DSC calls should always be acknowledged. The originator of the DSC call will normally dictate the method of acknowledgment (i.e., DSC, voice, etc.) and the working frequency in the initial DSC data transmission. ***If a specific method of response (i.e., SITOR) is not available to the called station, reply 'unable to comply'.***

2.2.2.12 Reporting Requirements. The collection of DSC statistics is an important tool as we attempt to measure both the effectiveness of DSC as a distress alerting mechanism, and the volume of calls being generated by this new system. MISLE incorporates DSC as a method of notification, and detailed MISLE entries by SMCs are crucial to this statistical gathering

process.

2.2.3 MF DSC Response Policy: Coast Guard Afloat Resources

2.2.3.1 Purpose. To provide Coast Guard afloat assets equipped with HF/MF DSC equipment with procedures for responding to MF DSC initiated distress alerts.

2.2.3.2 General. DSC radios maintain a continuous radio guard on MF frequency 2187.5 kHz, regardless of the channel that is tuned on the front panel. As such, cutters equipped with the DSC radios could receive a DSC distress alert on 2187.5 kHz. When a DSC distress alert is received, the radio will emit a loud audio alarm. ***DSC audio alarms shall be considered the equivalent of a "mayday" call, and requires the same level of response.***

2.2.3.3 Action. ***Coast Guard cutters equipped with HF/MF DSC transceivers shall guard 2187.5 kHz continuously while underway and at anchor. Cutters that receive a DSC distress alert shall take the following steps:***

(a) In areas where reliable MF DSC communications with one or more shore stations are feasible, CO/OinC's should defer acknowledgement so that a shore station can acknowledge receipt of the call. Any cutter receiving a call that is not acknowledged by a shore station within 5 minutes should acknowledge the call using procedures in Sub-paragraph (c) below.

(b) In areas where reliable MF DSC communications with a shore station are known not to exist, cutters that receive an MF DSC distress call should wait at least one minute before acknowledging receipt of the distress alert.

(c) Cutters acknowledging receipt of a DSC distress alert in accordance with Subparagraphs (a) or (b) should:

(1) Acknowledge receipt of the alert on the MF voice distress channel (2182 MHz) and attempt to establish communications with the distressed vessel.

(2) If unable to establish voice communications with the distress ship, cutters should acknowledge receipt of the distress alert using the DSC acknowledgment function. This action will send a DSC acknowledgement message to the distressed vessel, and terminate the DSC distress call.

(3) Cutters that acknowledge receipt of DSC distress alerts are responsible for notifying the applicable RCC (and Operational Control/Tactical Control, if different) by the most expedient means. Relevant information that could be available includes the distress vessel's MMSI number, position, and nature of distress. This information is normally included in the DSC alert and can be retrieved via the DSC radio display.

2.2.4 VHF-FM DSC Response Policy: Coast Guard Afloat Resources

2.2.4.1 Purpose. To provide Coast Guard afloat resources equipped with VHF-FM DSC with procedures for responding to DSC initiated distress alerts.

2.2.4.2 General. All Coast Guard vessels have VHF-FM DSC radios. The United States will not be declaring Sea Area A-1 operational until the Rescue 21 system is fully operational.

These radios maintain a continuous radio guard on VHF-FM channel 70, despite the channel that may be tuned manually on the front panel. As such, vessels equipped with DSC radios

could receive a distress alert on channel 70. When a DSC distress alert is received, the radio will emit a loud audio alarm. ***DSC distress alerts shall be considered the equivalent of a "mayday" call, and requires the same level of response.***

2.2.4.3 Action. ***Coast Guard boats and cutters receiving a VHF-FM DSC distress alert shall:***

(a) ***For Coast Guard Boats:***

(1) ***As soon as possible, inform the SMC of the contents of the distress alert.***

(2) In areas where reliable VHF-FM DSC communications with one or more shore stations are feasible, coxswains should defer acknowledgement so that a shore station can acknowledge receipt of the call. Any boat receiving a call that is not acknowledged by a shore station within 5 minutes should acknowledge the call using procedures in Sub-paragraph (4) below.

(3) In areas where reliable VHF-FM DSC communications with one or more shore stations are known not to exist, boats that receive a VHF-FM DSC distress alert from a vessel should, as soon as possible, notify the appropriate Sector command center and acknowledge receipt of the distress alert when instructed.

(4) Boats acknowledging receipt of a distress alert in accordance with Subparagraphs (2) or (3) should:

a. Acknowledge receipt of the alert on the VHF-FM voice distress channel 16 and attempt to establish communications with the distressed vessel.

b. If unable to establish voice communications with the distressed vessel, boats shall acknowledge receipt of the distress alert using the DSC acknowledgment function. This action will send a DSC acknowledgement message to the distressed vessel, and terminate the DSC distress call.

c. Boats that acknowledge receipt of distress alerts are responsible for informing the applicable Sector or RCC (and OPCON/TACON, if different) by the most expedient means, of relevant information, to include but not limited to, the distressed vessel's position, nature of distress and MMSI number. This information is normally included in the DSC alert and can be retrieved via the radio display.

(b) ***For Coast Guard Cutters:***

(1) ***As soon as possible, inform the CO/OinC of the contents of the distress alert.***

(2) In areas where reliable VHF-FM DSC communications with one or more shore stations are feasible, CO/OinC's should defer acknowledgement so that a shore station can acknowledge the receipt of the call. Any cutter receiving a call that is not acknowledged by a shore station within 5 **minutes** should acknowledge the call using procedures in Subparagraph (4) below.

(3) In areas where reliable VHF-FM DSC communications with a shore station are known not to exist, cutters that receive a VHF-FM DSC distress from a ship should, as soon as possible, acknowledge receipt of the distress alert.

(4) Cutters acknowledging receipt of a distress alert in accordance with Subparagraphs (2) or (3) should:

a. Acknowledge receipt of the alert on the VHF-FM voice distress channel 16 and attempt to establish communications with the distressed vessel.

b. If unable to establish voice communications with the distress ship, cutters shall acknowledge receipt of the distress alert using the DSC acknowledgment function. This action will send a DSC acknowledgement message to the distressed vessel, and terminate the DSC distress call.

c. Cutters that acknowledge receipt of distress alerts are responsible for informing the applicable Sector or RCC (and OPCON/TACON, if different) by the most expedient means. Relevant information that could be available includes the distress vessel's MMSI number, position, and nature of distress. This information is normally included in the DSC alert and can be retrieved via the radio display.

2.2.5 VHF-FM DSC Distress Alert Response Policy: Coast Guard Shore Units

2.2.5.1 Purpose. To provide operational shore units with policy guidance for responding to VHF-FM DSC distress alerts.

2.2.5.2 Discussion. Rescue 21 will provide Coast Guard Sector operational shore commands with VHF-FM DSC capability. Until the Coast Guard is fully equipped with this capability, notification of receipt of a VHF-FM DSC distress call may be received by sectors via Coast Guard vessels and other mariners equipped with VHF-FM DSC.

2.2.5.3 System Operation. VHF-FM radios equipped with DSC maintain a continuous radio guard on VHF-FM channel 70, despite the channel the owner may tune manually on the front panel. As such, vessels equipped with these DSC radios can receive a DSC distress alert on channel 70. When a DSC distress alert is received, most of these radios will emit a loud audio alarm and automatically shift to VHF-FM Channel 16. The distressed vessel can then begin a voice transmission on this frequency. ***VHF-FM DSC distress alerts shall be considered the equivalent of a "mayday" call, and require the same level of response.***

2.2.5.4 Action. ***All VHF-FM DSC distress alerts shall be assumed to be distress incidents and will be classified in the distress emergency phase. Coast Guard shore units that receive notification of a VHF-FM DSC distress alert shall:***

(a) ***Legacy System. Obtain relevant information from the reporting source, to include the distressed vessel's position, nature of distress, voice frequency and MMSI number.*** This information is normally included in the DSC alert and can be retrieved by the reporting source via the radio display. DSC equipped radios are also capable of transmitting messages other than distress. It is prudent for units to monitor ALL SHIPS and SAFETY alerts in the event that a situation could further develop into a DISTRESS incident.

(b) Rescue 21 System. The R21 system will automatically alert the watch stander to a distress DSC call with an audible alarm and a red flashing pop-up box that contains the information provided in the data burst. The system will automatically query the MMSI database for the watchstander and provide additional vessel and vessel owner data that may be needed to carry out the case.

(c) ***Both Systems. Attempt to establish VHF-FM communications with the distressed vessel on channel 16. If unable to establish voice communications with the distressed vessel, the SMC shall issue an Urgent Marine Information Broadcast (UMIB). This is the minimum response requirement for VHF-FM DSC distress alerts. The UMIB shall include text requesting mariners and shore stations that received the VHF-FM DSC distress alert to contact the Coast Guard with their position. The UMIB shall be broadcast for at least one hour at 15-minute intervals. Radio call-outs are not sufficient--a UMIB is required.***

(d) ***Both Systems. The SMC shall launch appropriate resources when there is sufficient information to establish a reasonable search area. In the absence of such information, search planners must engage in aggressive detective work, using every available means to narrow down a search area, including queries to ascertain if other boats or shore-based radios received the digital alert.***

(e) Both Systems. It is also possible that the same distress alert may be received by multiple high-level or Remote Fixed Facility (RFF) sites. For these reasons, it is important that Coast Guard units communicate with one another to ensure role clarity (i.e. which unit is SMC) during VHF-FM DSC case prosecution. The Rescue 21 system will be able to break down the data stream to identify the RFF(s) the call was received on and indicate the quality and strength of the signal received on each RFF.

2.2.5.5 SMC Responsibilities. ***For Sector SMCs that receive notification from third party vessels within their AOR equipped with VHF-FM DSC, they shall handle the case according to established procedures for "mayday" calls.*** The reporting source should be queried for the following information specific to the DSC call:

(a) Category of call (verify distress);

(b) Nature of distress;

(c) Position (if the distressed position is unavailable, request the position of the vessel, agency or radio tower that received the DSC alert and, if R21 equipped, refer to the information provided to you in the data stream for the necessary information); and

(d) MMSI number.

(1) For DSC calls that cannot be correlated, a UMIB should be made, utilizing the distressed vessel's MMSI. If communications cannot be established, the SMC should use the vessel's MMSI to query the MMSI Database maintained by OSC Martinsburg, the MARS database located on the ITU's website, or other sources in an effort to identify the distressed caller. Where no communications are possible, but a position is provided, assets should be dispatched to investigate as soon as possible. If no communications are possible and the MMSI is not registered then treat the distress call as an uncorrelated mayday (Section 3.4.9).

(2) ***For RCCs that receive notification from Coast Guard vessels within their AOR equipped with VHF-FM DSC, they shall collect the same information as above. SMC for VHF-FM DSC calls with a position that falls within a sector AOR may be delegated to the sector.***

2.2.5.6 Case Suspension. Normal SAR case suspension procedures apply for those DSC initiated

distress cases where:

(a) No communications with the distressed vessel can be established,

(b) No further information or means of contacting the vessel can be obtained from either database sources or other sources, and

(c) No position information is known.

2.2.5.7 False Alert Violation Reporting

(a) Unless a false alert is handled as a hoax case, a radio violation report should be submitted for every vessel, including foreign vessel in U.S. SAR areas of responsibility, for:

(1) Those who inadvertently transmit a false distress alert without proper cancellation, or who fail to respond to a distress alert due to misuse or negligence;

(2) Those who repeatedly transmit false alerts; or

(3) Those who deliberately transmit false alerts.

(b) Local Federal Communications Commission Field offices should be contacted to determine whether they will handle radio violations from foreign ships. If they will, violation reports should be submitted to them. If not, violation reports should be submitted to CG headquarters.

(c) Procedures for submitting violation reports are included in USCG Radio Frequency Plan, Reference (q).

2.2.5.8 False Alert Feedback Solicitations

(a) When a false alert is received a message should be sent to the offending vessel to ascertain the details associated with the alert. For recreational or other small craft that may not have record messaging capability, a mailing address should be found if possible and a letter sent in lieu of a message. The message/letter should indicate we are requesting the information to assist in sorting actual distress calls from false alerts and to help improve DSC system performance. Receipt of the message/letter by the offending vessel will help to educate the mariner on the proper use of the DSC Alert and implications of false alerts. Information received should be used by RCC's to identify system weaknesses. This information should be forwarded to the Office of Search and Rescue (CG-SAR).

(b) A sample message format is provided in Appendix C. The same text should form the basis of a false alert feedback letter.

Section 2.3
SafetyNET Messaging

2.3.1 General

SafetyNET messages are a tool used by Coast Guard SAR Mission Coordinators (SMCs) to alert the maritime public to a distress or potential distress situation. Example text is outlined in Appendix C, Section C.4. Organizational responsibilities and guidance on procedures was taken from Reference (r), the International SafetyNET Manual.

2.3.1.1 When to Issue a SafetyNET Message. SafetyNET messages should be issued whenever the SMC determines that important maritime information needs to reach beyond the coverage of NAVTEX UMIBs. In cases near the outer ranges of NAVTEX coverage, both a NAVTEX UMIB and a SafetyNET message should be broadcast. ***SafetyNET messages shall be broadcasted when UMIBs would normally be required for Sea Area A3.***

2.3.1.2 Who Should Issue SafetyNET messages. The International Maritime organization registers and authorizes Rescue Coordination Centers (RCCs) to broadcast, via SafetyNET, shore to ship distress priority alerts and other urgent information. SafetyNET messages are drafted using an INMARSAT-C supported web interface. Controllers at the nine Coast Guard District RCCs, plus RSCs Guam and Puerto Rico, have user names and passwords to access the secure web site.

2.3.2 SafetyNET Message Procedure

The following steps shall be followed for each situation requiring an INMARSAT-C SafetyNET broadcast. The INMARSAT-C web site offers an extensive Help Guide for understanding the fields and buttons on each web form. This help section should be referenced for additional information.

(a) ***Determine the type of message to send and whether the message should be distress, urgent, or safety priority.*** In general, messages sent during the uncertainty phase of SAR should be sent at a safety priority, messages sent at the alert phase should be sent with urgent priority, and messages sent during the distress phase will have distress priority. A cost will be incurred for using priorities other than Distress or Urgent (see Section 2.3.5). Select the message form on the web interface based on the type and priority of message to be sent.

(b) ***Draft message in accordance with Section 2.3.3 and Appendix C. Request a receipt for every message.***

(c) ***Print the screen.*** (see Section 2.3.4).

(d) ***Send the message.***

(e) ***Record the Message Reference Number (MRN).*** The MRN will be displayed across the top of the form after pressing send.

(f) ***Check status and save a copy of the message.*** The status of the message, with a link to a copy of the message, will be displayed on the Delivery Status section of the web site.

(g) ***Save a copy of the receipt.*** The message receipt is sent to the inbox after all repeats of the message have been broadcast.

(h) ***Compare the original message to a copy of the message received over an EGC receiver. If the message is not the same, cancel the message and send a new message. If the message is broadcast longer than needed, proceed to step (i).***

(i) ***Cancel the message.*** Messages are auto cancelled on the web page. If a case ends sooner than expected, cancel the message ahead of the scheduled auto canceling time. Messages that are not appropriately cancelled after the distress situation has been resolved inadvertently tie-up communication channels and the broadcasting unit may be levied with expensive fees until the message is finally cancelled.

2.3.3 Drafting a SafetyNET Message

Each SafetyNET message has addressing, subject, body (text of message), repeat count, repeat interval, and repeat echo options. Guidance on using these options is provided below.

2.3.3.1 Addressing a message for broadcast. ***Messages must be addressed to each satellite that covers the desired region of broadcast.*** Since the Atlantic is covered by both the AOR –E and AOR-W satellite regions; most messages addressed to a region in the Atlantic should be addressed to both satellites..

2.3.3.2 Addressing a message to a vessel. ***Messages to an INMARSAT-C mobile number must also be sent to a particular satellite.*** The recommended satellite selection for this type of message is "Best". The Best option sends the message to the satellite the terminal was last logged onto. If a message is sent to a satellite that the terminal is not logged into, the message will result in a fault of "absent" and will not be transmitted. The SMC should re-address the message to next applicable satellite until a successful transmission is made.

2.3.3.3 Subject. The subject of the message typed into the web form does not become part of the broadcast message. The subject will only appear under the subject heading on the delivery status table on the web site.

2.3.3.4 Text of SafetyNET Messages. The text of a SafetyNET message should contain as much information about the situation as is reasonable. For vessels, a description and last know position should be given when known. Both a latitude/longitude position and geographic description should be given if available. For sample messages, see Section C.4. of Appendix C.

2.3.3.5 RCC Name in Text. ***The name of the RCC sending the broadcast must be included in the text of the message.*** The name will be the keyword used for sending a "monitored" copy of the message back to the RCC. See Section 2.3.5. for more information on monitoring broadcasts.

2.3.3.6 Repeat Options.

(a) Echo. The repeat Echo option will broadcast the message after the first broadcast. Since a terminal cannot receive while it is sending messages, the Echo option allows a terminal that was sending a message during the original broadcast to still receive the broadcast. (Sending a message usually takes less than 6 minutes). The EGC receivers are manufactured to tilter out any messages already received. Terminals that have already

received the broadcast will not receive a repeat copy. In almost all cases, the Repeat Echo option should be selected (Drop down box is "yes").

(b) Repeat Count. The Repeat Count option is the number of times the message will be sent.

(c) Repeat Interval. The Repeat Interval option is the time period between each broadcast. This option is coupled with the Repeat count for how long the broadcast will be made, up to a maximum of 28 days, i.e., if a repeat count of 12 is selected, with a repeat interval of 4 hours, the message will be broadcast every 4 hours, up to 12 times for a total of 2 days of broadcasting. (24 hours in one day – 6 broadcasts a day).

2.3.3.7 Printing and Saving Drafted Messages. It is recommended that RCCs print the screen version of the message before sending. The screen version provides information about repeat count and interval that is not available from the version posted under the MRN number on Delivery Status. The version that is saved under the MRN should be saved electronically for records.

2.3.4 Monitoring SafetyNET Broadcasts

The International Maritime Organization (IMO) requires all Marine Safety Information (MSI) providers to monitor the broadcasts that they originate. ***Monitoring must be completed by viewing the actual message that is received over an EGC receiver*** (from Section 5.7 of Reference (r)). Messages sent directly to a vessel cannot be monitored***. RCCs shall confirm receipt of messages sent directly to vessels via INMARSAT-C's web interface.*** Status can be checked under delivery status and receipt can be requested. The message receipt indicates that message has been received by the vessel. It *does not* indicate that the message has been opened and read by the vessel.

2.3.4.1 Elements of Monitoring

(a) Check that the message has been broadcast;

(b) Confirm that the message is received correctly;

(c) Ensure that cancellation of the messages are properly executed;

(d) Observe any unexplained delay in the message being broadcast.

2.3.4.2 Receiving broadcast messages. The Coast Guard owns modified EGC receivers that receive all broadcasts to a satellite region and all copies of broadcast messages. The receivers to monitor AOR-E and AOR-W are located at CAMSLANT. The receiver to monitor Pacific Ocean Region (POR) is located at CAMSPAC. The Indian Ocean Region (IOR) cannot be monitored by the Coast Guard. The received messages are filtered by Coast Guard proprietary software and forwarded via CGMS record message to the originating RCC. Forwarding is based on the RCC name contained in the text of the message. Added to the header of each message is the "Rep #". Rep #'s start at zero. For example – if the message Rep # is 5, that copy is the 6th broadcast of the message. Echo messages will show the same Rep #.

2.3.4.3 Non-receipt of Broadcast Message. *If a monitored copy of the message is not received the following steps shall be taken:*

(a) ***The RCC shall contact the appropriate CAMS.*** CAMS units should be contacted based on the satellite region of the broadcast. CAMSLANT for AOR-E and AOR-W and CAMSPAC for POR.

(b) ***The appropriate CAMS shall troubleshoot the receiver system and CGMS backside.*** CAMS personnel will manually push through any messages that are not automatically forwarded. CAMS personnel will notify the RCC if the message was not received.

(c) ***If a message is not received, or was apparently not broadcast, the RCC shall cancel the broadcast and draft a new message for broadcast***.

(d) ***If the second broadcast is not received, the RCC shall contact the U.S. INMARSAT provider's customer care to troubleshoot problems with the web service.*** Area Command Centers and Commandant (CG-SAR) should be notified of any major problems with the web service.

2.3.4.4 Canceling Messages. The web service is set up to cancel messages after the Repeat count expires. It is the responsibility of the RCC to ensure the message was actually cancelled. Cancellation of messages should be verified under Delivery Status on the web page and by monitoring the messages broadcast over the satellite. The Rep # should not exceed the Repeat Count in the original message. ***If a message does not auto cancel correctly, or if a case ends prior to the all repeats being broadcast, the message shall be cancelled using the cancel option on the delivery status screen. In addition, a cancellation message shall be broadcast to insure that the mariner is aware that a SAR situation no longer exists, requires their assistance, or a case has been suspended pending further developments. This message shall be sent with the same priority as the initial SafetyNET message.*** The MSG # that appears on the monitored copy of the SafetyNet message should be used to reference the message being canceled. *Do not use the MRN # assigned by the web page.* For sample messages, see Section C.4 of Appendix C. Sending a cancellation message will not auto select the cancel option. Ensure the message is no longer being broadcast using the cancel option before broadcasting a cancellation message.

2.3.4.5 Back-up Monitoring. If the Coast Guard monitoring system for SafetyNET is not operational, the National Geospatial Intelligence Agency (NGA) will provide forwarding services via e-mail.

2.3.5 Message Types

The Coast Guard is authorized to send messages with SafetyNET service codes of Distress, Search and Rescue coordination, and Nav-Warning per Annex 4, Section C of Reference (r). The Distress service message can be sent with Distress Priority to a circular region. The SAR Coordination message can be sent with Distress, Urgent, and Safety Priorities to a circular or rectangular region. The Navigational-Warning service message can be sent with Urgent, Safety, and routine Priorities to a NAVAREA region. To send these types of messages using the web interface the Shore to Ship Distress Alert, Search and Rescue, and Navigational Warning EGC message forms are used. The table below describes, in general, what messages are most applicable during each of the SAR emergency phases, whether an Alarm sounds on a vessel for each message, the addressing format for that message, and a typical header that is displayed on the received message. (Headers are dependent on the manufacturer of each receiver.)

Table 2-3 SafetyNET Message Types

Emergency Phase	Web form(s)	Priority	Alarm	Addressing	Header of bcst msg
Uncertainty	Search and Rescue	Safety	No	Circular	SAR <priority> Call to Area: (specific Circular or Rectangular region)
	Navigational Warning	Safety	No	NAVAREA	MetWarn/Fore <priority> Call to Area: (# of Navarea)
Alert	Search and Rescue	Urgent	Yes	Circular	Search and rescue: (specific Circular or Rectangular region)
	Navigational Warning	Urgent	Yes	NAVAREA	NavWarn/Fore Safety Call to Area: (# of Navarea)
Distress	Shore to Ship Distress Alert	Distress	Yes	Circular	Distress <priority> Call to Area: (specific Circular region)
	Search and Rescue	Distress	Yes	Rectangular	Search and Rescue (specific Circular or Rectangular region)

Note: Area and District command centers will incur a fee for any SAR messages sent with a priority of Safety.

Section 2.4
Maritime Mobile Service Identity (MMSI) Numbers

2.4.1 Introduction

The International Maritime Organization (IMO) has adopted the International Telecommunication Union's (ITU) Maritime Mobile Service Identity (MMSI) as an internationally recognized method for identifying distress alerts from automated radio equipment (i.e. DSC alerts). In addition, foreign 406 MHz EPIRBs are also being encoded with MMSI data.

MMSIs are nine digits and, like a call sign, uniquely identify a specific vessel. The first three digits of the MMSI indicate the country to which the vessel is registered. The final six digits serve as the Ship Station Identifier.

Vessels using MMSIs can be identified by consulting the MMSI database maintained by OSC Martinsburg or by contacting the following sources:

2.4.1.1 **For U.S. MMSIs** (338, 366, 367, 368, 369 or 303): FCC Watch Officer (202) 632-6975;

2.4.1.2 **For all other countries:** ITU Publication "List of Ship Stations"; MARS Database on ITU website; or via POCs listed in the International RCC Directory: http://www.itu.int/online/mms/glad/cga_mids.sh?lng=E

2.4.2 MMSI Assignment and Registration

2.4.2.1 **SOLAS Class Vessels.** The FCC assigns and will continue to assign marine radio licenses (and MMSI numbers) to U. S. SOLAS class vessels, which were required to have a DSC capable radio by 1 February 1999. The FCC sends the information contained on the vessel licenses to OSC Martinsburg, for inclusion in OSC's MMSI Database.

2.4.2.2 **De-licensing of Recreational Boat Radio Stations.** An FCC regulation requires that all marine radio type accepted after 1 June 1999 have DSC capability. This only refers to new radio designs existing designs can continue to be manufactured as presently configured (without DSC) for as long as the manufacturer desires. Despite the fact that all newly type accepted VHF-FM marine radio types contain DSC, the de-licensing of recreational boat radio stations that occurred as a result of 1996 Congressional action also removed the most effective means of assigning MMSIs to this constituency.

2.4.2.3 **MMSI Assignment for non-SOLAS Class Vessels.** In order to avoid having recreational boaters apply for an otherwise unnecessary license from the FCC in order to receive a valid MMSI, and pay the corresponding licensing fee, a new process for assigning MMSI numbers has been developed. The FCC issued a Public Notice in March 1997, soliciting for alternative management of the MMSI issuing process for non-SOLAS class vessels. Boat U.S. and SEATOW have a signed a Memorandum of Understanding (MOU) with the FCC and the Coast Guard in which they are authorized to issue MMSI numbers for non-SOLAS class vessels. Boat U.S. and SEATOW have also agreed to collect registration data from boaters and to download this information to the Coast Guard for search and rescue purposes. SHINE MICRO and the U.S. Power Squadron are also authorized issuers of MMSIs. MMSIs may be applied for online at http://www.boatus.com/mmsi.

2.4.2.4 MMSI Assignment for U. S. Coast Guard Vessels and Shore Units. Information concerning the process of determining or acquiring MMSIs for Coast Guard specific vessels and shore units can be obtained from the Office of Communication Systems (CG-622). U.S. Coast Auxiliary surface vessel operators should request assignment of MMSIs using the same method as for a U.S. Non-Federal user. Additional information on MMSIs can be found at the site: http://www.navcen.uscg.gov/?pageName=mtMmsi . This site also provides general information on the MMSI numbering system.

2.4.3 MMSI SAR Vessel Identification System

In response to the SAR Program's requirement for accurate registration information on the owners of DSC radios, OSC Martinsburg has replaced the SAR ID Database with the web-based Maritime Mobile Service Identity (MMSI) Vessel Identification System ("MMSI Database"). The MMSI Database can be accessed via the Coast Guard MISLE system under vessel look-up. This database provides the SAR Planner with a rapid, reliable means of obtaining vessel information when planning a SAR case. The application allows the user to search for vessel information by Vessel Name, Vessel Call Sign, Official or State Registration Number, MMSI Number, IMARSAT Number, EPIRB Registration Number, or Soundex Search (vessel name only).

Queries will return all communications and contact information available for the vessel from the MMSI Database, as well as from the Lloyd's database. The MMSI Database includes available information from the Federal Communications Commission, Australian Maritime Safety Agency, International Telecommunications Union, International Registries – Liberia, International Registries – Marshall Islands, and also recreational boater information collected by SeaTow and Boat U. S. SAR watchstanders that work cases with vessels not registered in the MMSI database should add new records to the database with as much information as possible.

Section 2.5
National Distress and Response System (NDRS) and Rescue 21

2.5.1 General

The Coast Guard is authorized by federal law (14 USC §2) to develop, operate and maintain "...rescue facilities for the promotion of safety on, under, and over the high seas and waters subject to the jurisdiction of the United States...". This authorizes the Coast Guard to provide distress and safety communications for the boating public, both commercial and recreational. The system established and maintained by the Coast Guard to provide this service is the VHF-FM National Distress and Response System (NDRS). The primary function of the NDRS is to receive distress alerts, coordinate SAR operations, and communicate with all maritime interests in waters (including inland waters) in which the Coast Guard has SAR responsibilities. A secondary function is to provide short-range command and control communications for all Coast Guard missions.

Since 1948, the Coast Guard has been dedicated to the concept of a terrestrial based VHF-FM System as the primary national system for short-range safety and distress communications. A VHF-FM project was established in 1970 to implement nationwide VHF-FM coverage; survey existing facilities, requirements, and needs; and forecast future Coast Guard mission requirements. The system was designed to provide short-range (20 NM from the coastline) distress, safety, and command and control communications in all areas of maritime activity where the Coast Guard had jurisdiction. The title “National VHF-FM Radiotelephone Safety and Distress System” was shortened to the “VHF-FM National Distress and Response System (NDRS)”.

Currently the National Distress and Response System Modernization Project (NDRSMP) is replacing the NDRS short-range communication system outdated legacy equipment with an integrated communication equipment suite called Rescue 21. To clarify, the NDRS is the name for the short-range communications function, while Rescue 21 is the name of the equipment suite used to implement the NDRS function. Rescue 21 is an upgrade that is occurring not only to the remote communication sites and connecting infrastructure, but also at the Sectors, Stations, and MSUs.

2.5.2 NDRS Coverage

The VHF-FM National Distress and Response System (NDRS) provides distress, safety, and command and control VHF-FM communications coverage in all areas of maritime activity in which the Coast Guard has SAR responsibilities. Coverage is required for:

(a) Coastal areas to at least 20 nautical miles offshore and in adjacent tidal waters. In areas where heavy concentrations of boating activity exist greater than 20 nautical miles offshore, coverage will also be provided to the extent practicable.

(b) All large bodies of inland waters such as Puget Sound, Long Island Sound, Chesapeake Bay and the U.S. waters of the Great Lakes.

(c) Navigable waterways where commercial or recreational traffic exists and the Coast Guard has SAR responsibility.

2.5.3 NDRS Hardware

The current NDRS is a collection of independently controlled VHF-FM base stations with multi-channel transceivers located at more than 300 sites in the continental U.S. (CONUS), Puerto Rico and the Caribbean, Alaska, Hawaii, and Guam. Each site has a transceiver, an antenna, and remote control hardware. In most cases, primary power is provided commercially, although backup power is available at a few selected locations. Locations were selected and distributed to provide the widest coverage possible; consequently, NDRS hardware is frequently co-located with other non-Coast Guard communications equipment. Since antenna height significantly affects the coverage area, the Coast Guard attempts to locate these sites to provide the greatest possible antenna height. As a result, NDRS transceiver sites are frequently referred to as "High Sites". Sectors control base stations locally or remotely through the best available means. Particular attention was paid to optimizing the receiving capability. The system was designed to achieve a high state of operational readiness using leased equipment and maintenance contracts.

2.5.4 Channel 16

Channel 16, 156.8 MHz, is designated as the maritime international distress and calling frequency and is monitored by Sectors on a 24-hour-a-day basis via the NDRS. When a non-distress call is received on this frequency, the caller is usually asked to move to a working channel, if possible, to keep the distress channel available. ***Great care must be used to ensure communications are not lost with the person(s) calling the Coast Guard, in distress or not***.

2.5.4.1 Active Listening. Two-way radio communications are often less effective due to weak reception/transmission, atmospherics, language dialects, or a heightened emotional state due to an emergent situation. When the information received is not absolutely clear to comprehend, it is *strongly recommended* that an effort be made to repeat the most critical information back to the sender to affirm the specific details. Inaccurate or incomplete information can result in search planners and operational units coordinating a response in a different manner based on the information provided. Time spent on ensuring that the information received is valid and accurate is worthwhile so that responding units can maximize their efficiency. An additional benefit of this practice is that other mariners operating in the general vicinity of a distress situation are better informed regarding the case particulars and may be more inclined to render assistance in a timelier manner than a unit that has to deploy from shore or divert from another mission to respond.

{Example: “Roger Sir, I understand that you are disabled ¼ nautical miles southwest of the sea buoy and are in need of assistance.”}

2.5.5 Other Uses of NDRS

In addition to distress traffic, the NDRS is the primary tactical, short-range command and control communications system used by Coast Guard Sectors, stations, and equivalent units. Typical uses include communications between Sectors/stations and their underway vessels; COTPs; and Vessel Traffic Service controllers and vessels. ***In addition to these uses, the Coast Guard must transmit marine safety information broadcasts over the NDRS at specified intervals.*** Note: that the receiver monitoring Channel 16 is inactive at any site that is transmitting safety broadcast or other VHF communications.

2.5.6 Channel 16 Monitoring Requirements

All ships required to carry a VHF radio by SOLAS, Federal Communications Commission or Coast Guard regulations are additionally required to maintain a continuous watch on Channel 16. Ships are exempted from this watch only when participating in a vessel traffic service, or when communicating on another VHF channel.

2.5.6.1 Channel 16 SEELONCE Broadcast. The Rescue 21 communications system provides direction finding as an integrated function. This is a significant tool that will assist in locating vessels in distress. Because every call on channel 16 will generate a line of bearing on the Geo Display it is important to remember that weaker signals will be stepped on or blocked out by the stronger signals. ***If a mayday is detected and the Operational Unit (OU) watchstander and/or Communications Unit (CU) watchstander are unable to isolate the call because of heavy non-emergent traffic then the CU watchstander shall send out a "SEELONCE MAYDAY" broadcast (Reference (s), chapter 2.F or Section 4.1.6.8) to limit the traffic and subsequently the LOB's that appear on the Geo Display screen.*** This action should assist the OU and CU watchstanders in isolating the mayday signal.

2.5.6.2 VHF-FM Idiosyncrasies. The Rescue 21 communications system is not immune to those idiosyncrasies that plague the VHF-FM system. These issues include Tropospheric ducting (skip), echoing, block-out, transmission reception quality, and transmission bounce.

(a) **Tropospheric Ducting** is where a radio transmission is received at the command center that is beyond the communications system operating limits. This can also be related to skip or tunneling. The speed of a radio wave in the atmosphere is determined by the dielectric property of the air. This property depends on the pressure, temperature and humidity of the air. In general as we move upwards through the atmosphere the pressure decreases and temperature falls. This means that the dielectric property changes with height and allows a slight increase in the speed of a radio wave as we move upwards through the atmosphere. This in turn means that if a radio wave moves away from the earth at an angle less than 90 degrees, then the upper part of the wave travels faster than the lower part. Therefore even under normal conditions this can in effect bend, or refract, the wave back down to earth.

The normal rate of change of dielectric constant with height refracts the wave so that it follows a curved path of about 1.3 times the radius of the earth. Therefore, we typically can receive signals which are 1.3 times further than we can see by line of sight.

Tropospheric ducting occurs when we get a sharp rate of change in the dielectric constant as we move upwards through the atmosphere. This occurs when we get a rapid increase of temperature and a rapid decrease in humidity (dew-point) with height.

Under these conditions we now have the radio wave bent back towards the earth. However, the radio wave can then reflect back off the earth and become refracted again to return earthwards once more. Occasionally, this can happen a number of times with little attenuation but with some fading. The result can be long distance reception of radio waves that would normally have been far beyond the radio horizon. See Figure 2-2 below. The above information and Figure 2-2 were found at:

http://homepage.ntlworld.com/colin.martin5/radio/ducting.html

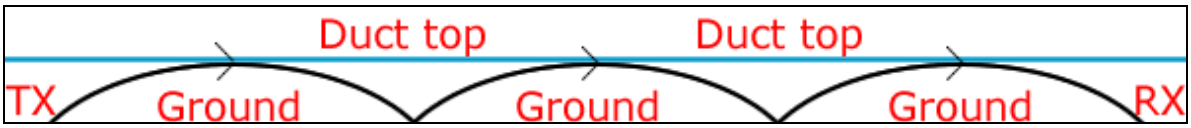


Figure 2-2 Ducting

(b) **Echo or signal distortion** can happen when a signal is simultaneously broadcast over all RFF's within a region using the Rescue 21 system as in Figure 2-3 below. It is expected that the levels of echoing and signal distortion will be minimal. However, if units experience a significant degradation of service to the maritime public, as a result of using the simultaneous method of broadcasting, the specific incidents should be documented and a report sent via chain of command to Commandant (CG-62).

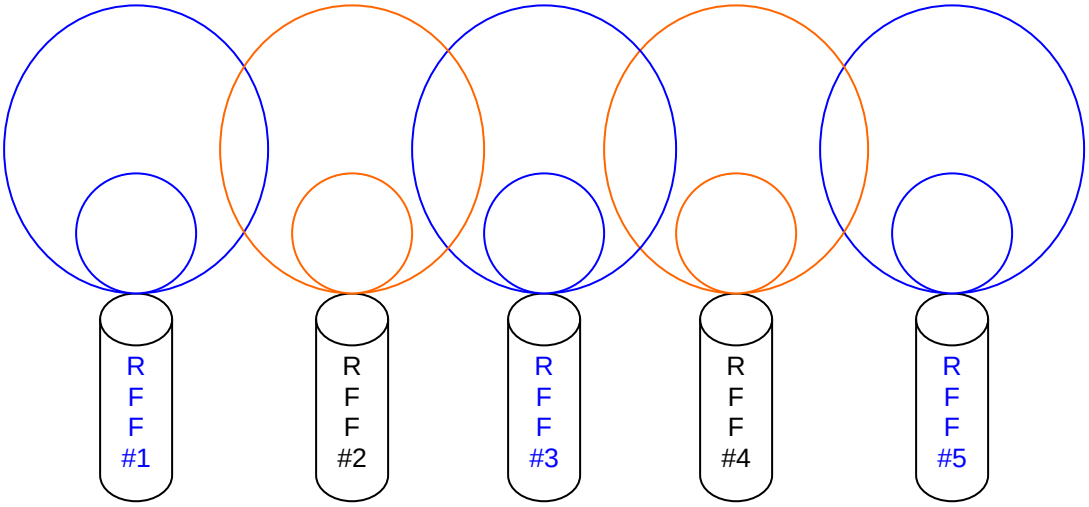


Figure 2-3 Echoing

(c) **Block-out** is where one transmission is heard at a time. This usually occurs when a stronger signal steps on a weaker signal.

(d) **Transmission reception quality** can be affected by range, atmospheric effects (ducting) and signal strength. See Figure 2-4 below.

Range	< 20nm				> 20nm			
Type of Propagation	Good Day		Bad Day		Good Day		Bad Day	
High/Low Power	High	Low	High	Low	High	Low	High	Low
Reception Quality								

Figure 2-4 Transmission Reception Quality

(e) **Transmission bounce** is where a signal is reflected off a building or large structure and is then received in the command center as shown in Figure 2-5. The bounced signal may create a LOB in the direction of the building or structure it bounced off of. If the signal is strong enough the command center may receive 2 LOB from different directions with the same voice transmission just milliseconds apart. The CUC will have to use the local knowledge to determine the most likely direction of the call if the distressed caller cannot be reached.

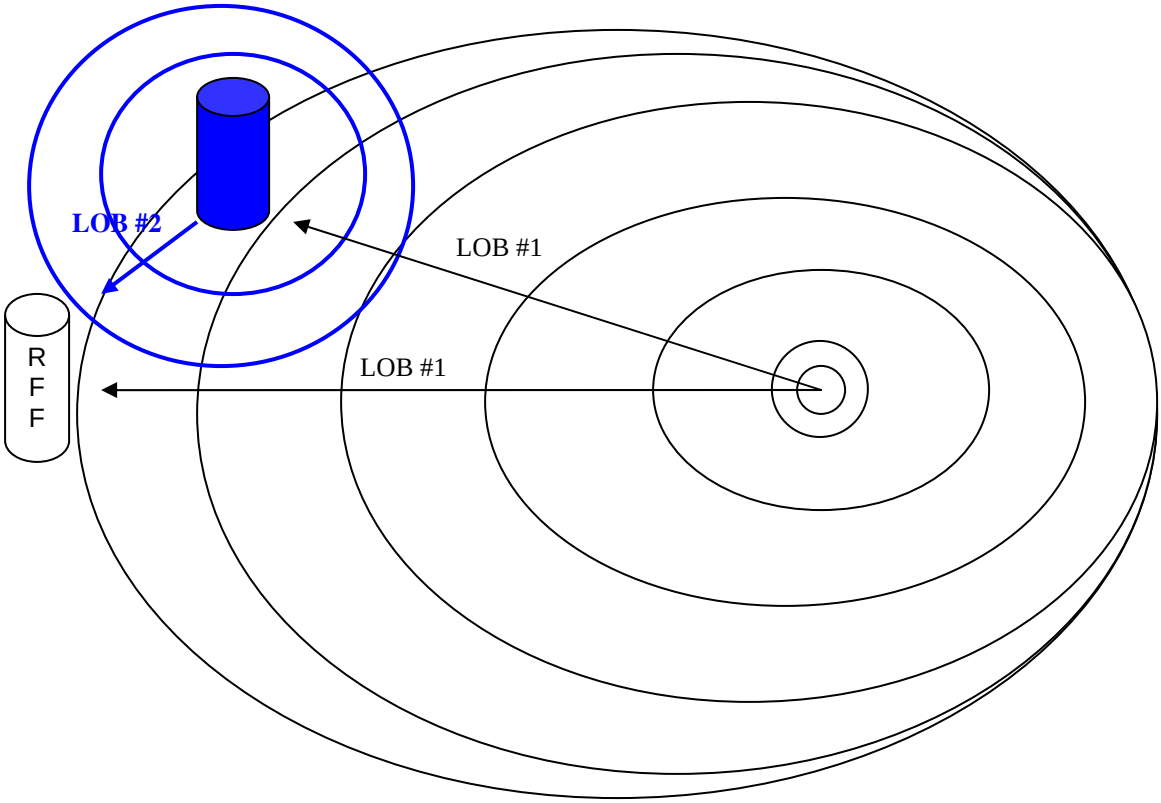


Figure 2-5 Transmission Bounce

2.5.7 New Capabilities Provided by the Rescue 21 System.

2.5.7.1 Available channels/circuits. Each high-level site or Remote Fixed Facility (RFF) will have 6 radios.

Radio 1: VHF Guard – Dedicated channel 16

Radio 2: VHF(1) – Open to select channels

Radio 3: VHF(2) – Open to select channels

Radio 4: UHF – Open to select channels

Radio 5: DSC Guard – Dedicated to channel 70 (data only)

The open channels can be distributed to the regional stations for use at the Sector command center's discretion. For example, each high level site has 3 channels for general use, and if a command center has 5 high-level sites within their AOR, then that totals 15 channels from which to choose for distribution. The Sector command center maintains full control of every RFF at all times.

2.5.7.2 Digital Selective Calling. The basic functionality of DSC is described in Section 2.2. In addition to the basic functionality, Rescue 21 also provides the ability to plot the DSC call on a geographic display and to rapidly interrogate the MMSI database to obtain any available information associated with the originating MMSI.

2.5.7.3 Communications Coverage. The Rescue 21 communications coverage has been upgraded to receive a transmission of a 1-watt radio 2 meters high out to 20NM. The majority of maritime radios are 5 to 25-watts and are higher off the water, increasing reception range.

(a) In regions where the Remote Fixed Facilities or RFFs, formerly referred to as high-level sites, are shared (when one RFF covers a portion of 2 AORs), the Sector region in which the RFF resides has primary control.

(b) ***If the shared RFF is needed to perform Coast Guard missions in the secondary region then the secondary user must request control of the RFF.***

(c) ***The primary user shall relinquish control of shared towers for higher priority missions, such as, SAR, MEDEVAC, etc***.

2.5.7.4 Conferencing or Phone Patching. Conferencing is a function that allows USCG radio operators to communicate with Federal, State or local agencies. For example, if a Coast Guard boat needs to communicate with an ambulance waiting on shore, the Sector communications unit controller is able to call the ambulance company and patch the ambulance and Coast Guard boat directly with a few keystrokes in a console-to-console connection. Once the two units are connected all transmissions will be heard over both of the frequencies being used by each asset. It is advisable that the Coast Guard use working channels when connecting into such a phone conference.

2.5.7.5 Automated Broadcasts. The automated broadcast feature can be used for single or repetitive radio broadcasts. The broadcast can either be recorded in the operator's voice or broadcast with a voice synthesizer. Once the broadcast has been composed, recorded and is ready for release, a prompt will confirm the request for release so that broadcasts are not released prematurely. Additionally, the prompt will reappear each time the broadcast is to air. This will allow the operator to cancel the broadcast if it is no longer needed or change the broadcast as necessary.

2.5.7.6 Recording and Playback. All communications within the R21 system are recorded and are available for immediate playback.

Section 2.6
Urgent Marine Information Broadcasts (UMIBs)

2.6.1 General

Urgent Marine Information Broadcasts (UMIBs) are a tool used by Coast Guard SAR Mission Coordinators to alert the maritime public to a distress or potential distress situation. Specific communications procedures and formatting to be used for UMIBs are outlined in Chapter 12 of Reference (p), the Coast Guard Telecommunications Manual.

2.6.1.1 When to Issue a UMIB. UMIBs should be issued whenever the SMC determines that important maritime information needs to reach the widest possible audience. ***UMIBs shall be used upon the receipt of***:

(a) all uncorrelated MAYDAY channel 16 calls;

(b) uncorrelated VHF-FM DSC distress calls;

(c) flare sightings;

(d) overdue vessel reports; and

(e) other situations as deemed necessary by the SMC.

UMIBs should be issued on a schedule as outlined in Table 12-1 of Reference (p). In general, this means a UMIB is issued upon receipt, and every fifteen minutes thereafter for the first hour. After that time, UMIBs are issued along with scheduled broadcasts until cancelled, or as directed by the originator on a case-by-case basis.

2.6.1.2 Who Should Issue a UMIB. Qualified communications personnel at COMMSTAs and Sector Command Centers, when directed by appropriate authority, will issue UMIBs. ***All UMIBs shall comply with the requirements and provisions Reference (p).***

2.6.1.3 Text of UMIBs. The text of a UMIB should contain as much information about the situation as is reasonable. For vessels, a description and last known position should be given when known. Both a latitude/longitude position and geographic description should be given if available. ***UMIBs that are to be broadcasted on VHF-FM shall include the time of the incident in both local time and Greenwich Mean Time (GMT).***

The Rescue 21 system will provide the format for the draft automatically; however, watchstanders must assure that all the pertinent information is provided. It will also allow automatic scheduling and broadcast of the UMIB on the time interval determined by the Duty Officer.

2.6.2 UMIB vs. Callouts

Callouts differ from UMIBs in that they are a radio broadcast directed toward a specific vessel, rather than directed at a broad audience, as is the UMIB. Callouts also do not imply or require a state of "urgency" whereas the UMIB by definition conveys urgency. Usually callouts are appropriate at the earlier stages of an overdue vessel case in an attempt to establish communications with a specific vessel. When callouts fail, a UMIB will be issued. The use of callouts should not unduly delay the use of a UMIB.

2.6.3 UMIB vs. MAYDAY Relay

Mayday Relays are intended to alert the maritime public of an incident involving imminent danger to life. They are appropriate under three circumstances:

(a) When a unit not in distress seeks assistance for a unit that is in distress;

(b) When a responding unit realizes that additional assistance beyond their own capability is required; and

(c) When a distress message is heard by a unit not in a position to assist and that message is unacknowledged.

The majority of Coast Guard originated "Mayday Relay" messages would fall under (a) above. It is a value judgment made by the controller based an evaluation of all relevant circumstances, i.e. weather, previous indication of distress, or debris sighting.

Section 2.7
Cellular Telephones and *CG

2.7.1 Cellular Telephones

Maritime cellular telephone usage is growing rapidly, and an increasing number of boaters are relying on cellular telephones in conjunction with, or sometimes instead of, VHF-FM radio to communicate with the Coast Guard. Cellular telephones can be a reliable supplemental means of communication for boaters in distress to contact the U.S. Coast Guard for help. Cellular telephones are NOT a replacement for VHF-FM radios, which remain the most effective and preferred method of voice communications, particularly in an emergency. While a cellular telephone is not the recommended or preferred method of distress communications, when properly used it does meet the requirements of reliable communications as outlined in the Maritime SAR Assistance Policy.

2.7.1.1 The Coast Guard continues to encourage the use of VHF-FM radio as the primary method of distress notification. Cellular telephones are not an "alternative" to VHF-FM, which affords additional functionalities that are valuable in SAR, in contrast to the serious limitations of using a cellular telephone, particularly in an emergency.

(a) VHF-FM allows broadcast capability while cellular limits communications to point-to-point communications. Cellular telephone conversations cannot be heard by other boaters in the area who may be in a position to render immediate aid to someone in distress.

(b) VHF-FM allows easy direction finding on the generating station. Determining the general area (generally a 10-15 mile radius) of a cellular call requires close coordination with cellular service providers to identify the cellular "cell" from which it was placed, which is a time consuming endeavor.

(c) VHF-FM allows mariners to easily receive Broadcast Notice to Mariners, Urgent Marine Information Broadcasts, Urgent Weather Advisories, and Marine Assistance Request Broadcasts while cellular telephones will not receive this critical information.

2.7.1.2 Due to the limitations of cellular telephones, as outlined in Paragraph 2.7.1.1, SAR checklists should include the following additional items for cases involving their use:

(a) caller's complete cellular telephone number including area code;

(b) user's cellular service provider or carrier (i.e., "Bell South Atlantic");

(c) whether or not a roam number is needed to recall the user and what the complete roam number is;

(d) whether or not other means of communications are available (establish other communications with the caller before terminating the cellular call);

(e) wattage of the cellular telephone, antenna height from the waterline, and approximate battery strength;

(f) establish a communications schedule or require the caller to call back at a scheduled time if possible; ensure user understands the cellular telephone, if there is sufficient battery strength, must not be turned off in order to receive further communications;

(g) ask if the user has an alternate power source available, such as a charged back-up battery or the ability to plug into the boat's power system;

(h) if a Maritime Assistance Request Broadcast will be made, notify the caller that their cellular telephone number will be broadcast when the Commercial Assistance Provider or Good Samaritan contacts the Coast Guard on the alternate working frequency; and

(j) obtain a shore-side point of contact.

2.7.1.3 Most cellular service providers offer some of the following services to assist in locating the origin of cellular calls from disoriented boaters.

(a) **Call Trace:** As long as there is a connection, the carrier's technician can determine which cell is receiving the call and, if power and antenna height are available, an approximate arc of distance from the cell tower.

(b) **Call Trace Modified:** After the call is initiated and the technician is notified, the caller can be instructed to call back at a specified time and the technician can determine through the use of signal strength at several cell sites, a more accurate probable position of the caller.

(c) **Cell Traffic Recording:** A carrier can determine the cell location of the last call placed by the subscriber given the cellular telephone number.

(d) **Tap:** This function provides notification when a call is made from the user's phone; beneficial in overdue cases.

(e) **Caller ID:** Indicates the number of the calling party, provided CG emergency line does not go through most private branch exchanges (PBX). Requires subscription from local carrier. If number is not displayed, Caller ID indicates whether carrier limitation or privacy blocking is the cause.

2.7.1.4 **Cellular Tower Locator**. When SAR watchstanders have determined that a case is in the distress phase, they may contact cellular companies to obtain call-identifying information through the cellular tower locator process. 18 U.S.C. § 2702 permits cellular companies to release call-identifying information to a government entity. However, to obtain this data without permission of the individual, exigent circumstances must exist. ***SAR watchstanders must determine that the case is in the distress phase, and shall articulate that they believe the subject is in imminent danger. If a SAR watchstander determines that a case is in the alert or uncertainty phase, the watchstander shall complete pre-comms and ex-comms to investigate or obtain information on a vessel's location.*** When a distress call is received via Cell Phone and the caller's location is not known, use the procedures in Table 2-4 to identify the location of the cell tower and determine the tower's footprint. To supplement this procedure, a list of information to pass and questions to ask when talking with the cellular provider are provided in Paragraph 2.7.1.5 below.

Table 2-4 Cellular Tower Locator Process

Step	Action
1	Obtain the caller's name, cellular number, and cellular provider.

2	If unable to obtain provider from the caller, enter the cellular number into http://www.fonefinder.net/ to determine the provider.
3	Contact the provider's Subpoena/Court Order Compliance Center and request the tower location (and height) for the most recent call. SPRINT & NEXTEL (888) 877-7330 AT&T – (800)635-6840 option 4 VERIZON – (800)451-5242 option 4 US CELLULAR – (630)875-8270 or (865)777-8200 (after hours)
4	Explain that you are from a Coast Guard emergency response center; you have received or are the intended recipient of a distress call from a cellular phone serviced by the provider IAW 18 U.S.C. § 2702(b)(1) & (3). ***If applicable***, tell the provider's Center that you have determined that an emergency exists that involves immediate danger of death or serious physical injury; IAW 18 U.S.C. § 2702 (b)(8), this emergency justifies disclosure of cell tower information without delay.

(a) Communication companies are very reluctant to release information regarding their customer's communications as this may open them to lawsuits for violating their customers' privacy. There are essentially two statutes that will allow communication companies to release information to law enforcement organizations: 18 U.S.C. § 2703 and 18 U.S.C. § 2702.

(b) 18 U.S.C. § 2703 pertains to criminal investigations and requires a communication company to divulge requested information when presented with either a subpoena or a court order. Communication companies are very familiar with this statute; however, as it is geared towards criminal prosecution, it does not apply in the case of the Coast Guard trying to obtain electronic communications information to aid in SAR.

(c) On the other hand, 18 U.S.C. § 2702 is applicable when trying to obtain electronic communications information to aid in SAR. However, communications companies are not as familiar with this statute and some "operators" may think that a court order or subpoena is needed when this is not the case. Consequently, you may need to educate the operator on § 2702.

(d) In the SAR context, § 18 U.S.C. 2702 permits, but does not require, providers to disclose call-identifying information under any of the following circumstances:

(1) Section 2702(b)(1) permits providers to disclose call-identifying information "to an addressee or intended recipient of such communications or an agent of such addressee or intended recipient." SAR controllers may apply this provision when receiving a call directly from the mariner seeking assistance or when receiving a third-party relay of a request for Coast Guard assistance. Likewise, this provision would apply if any "agent" of the Coast Guard, including but not limited to off-duty Coast Guard personnel or Auxiliarists received the initial cellular call and then relayed it to the SAR controller.

(2) Section 2702(b)(3) permits providers to disclose call-identifying information with "the lawful consent of the originator or an addressee or intended recipient of such communication." SAR controllers may apply this provision using a three-way call between the distressed mariner, the SAR controller, and the provider, which allows the provider to confirm consent of the originator. Likewise, but perhaps more difficult for providers to accept, the Coast Guard may consent to the release of call-identifying information when it is the addressee or intended recipient. Providers may be reluctant to implement this authority in the absence of authentication from the originator.

(3) Section 2702 (b)(8) permits providers to disclose call-identifying information to a governmental entity, if the provider, in good faith, believes that an emergency involving danger of death or serious physical injury to any person requires disclosure without delay of communications relating to the emergency." SAR watchstanders may apply this provision if the position uncertainty or other factors create an "emergency involving danger of death or serious physical injury to any person." ***When asserting this basis for disclosure, SAR watchstanders shall explain to the provider the facts supporting the emergency rationale underlying the request.***

(e) Because §2702 does not require the communication company to release the requested information, unlike §2703, the Coast Guard caller may need to convince the communication company that there really is an emergency and that the situation falls within 18 U.S.C. § 2702.

(f) Getting the desired cellular tower information should normally not be a problem. However, the various communication companies do vary on their policies regarding the release of the information. It is harder to get the information from some companies than from others. The same is true regarding the operators with whom you will speak. You may need to be persuasive. If the operator does not give you the desired information, ask for the supervisor. If the supervisor will not give it to you, call the duty attorney.

2.7.1.5 Information to pass and questions to ask when talking with the cellular provider. SAR Controllers should tell the Service Provider Operator the following things:

(a) If you have the distressed caller on the three-way line:

(1) I am with the United States Coast Guard.

(2) I am a Search and Rescue Watchstander.

(3) I have on the line a person who is one of your wireless service customers, and who right now requires assistance from the Coast Guard. Their distress call was received via his/her cellular telephone.

(4) In order to dispatch search and rescue resources I will need to know what cell or quadrant this phone call is being made from and which tower is receiving this transmission.

(5) Since your customer is on the line with me now, he can authorize you to release that information to me right now.

(6) Please go ahead operator and ask the caller what you might need to release this information to me now.

(b) If you cannot keep the caller on the line, or do not have access to three-way calling, or received the distress call via relay from a third party, then tell the service provider:

(1) I am with the United States Coast Guard.

(2) I am a Search and Rescue Watchstander.

(3) I have just received a distress call from a person calling on a cellular phone serviced by your company. I have the name and telephone number of the caller.

(4) In order to release search and rescue resources I need to determine the location of this caller.

(5) The only way to determine the position of the caller is to utilize the information you have on the cell and tower position of this call.

(6) Pursuant to Federal law, the Coast Guard, as a law enforcement entity and federal agency with emergency response authority, is entitled to this information if it is the intended recipient of the call or in the event that lives are in danger. It is our belief that the Coast Guard was the intended recipient of this maritime distress call [and, *if applicable*, if we do not dispatch search and rescue resources to this call this person could be injured or killed].

(7) Would you please release this information to me?

(c) If you get resistance from the operator:

(1) I am prepared to fax to you and to your supervisor a memorandum drafted by our lawyers and signed by the Coast Guard District (or Sector) Commander explaining this authority and why you should release such information as soon as possible. (see para. 2.7.1.6 below)

(2) Can I please have your fax number and the name of your supervisor? I need to bring this to his/her attention as soon as possible.

(d) If there is still resistance:

(1) Please give me the contact information for your in-house attorney. This matter needs to be dealt with as expeditiously as possible.

2.7.1.6 Standard Release of Call-Identifying Information Letter. If, after explaining the SAR situation and relevant authority to the provider, the SAR controller is unsuccessful at securing a disclosure of information from the provider, the SAR controller should have available a standard letter, signed by the USCG District or Sector Commander that can be immediately faxed to the provider's offices. This letter, on USCG letterhead, should explain the legal authorities under which the release of the call-identifying information is allowed. The SAR controller should encourage the provider's operator to consult with available management. The following is a Sample Letter Requesting Release of Call-Identifying Information:

3130
Date

Cellular/Wireless Communications Provider
Fax Number:

Dear Sir or Madam:

I am faxing this letter to request the urgent release of the cellular quadrant and tower location of the call made from the cellular telephone number (insert #) in accordance with 18 U.S.C. § 2702.[1] The caller has made an emergency distress call intended for the U.S. Coast Guard.[2] [*If appropriate*: *This is an emergency involving danger of death or serious physical injury to any person requiring disclosure without delay of communications relating to the emergency.* If available, add brief summary of facts supporting this statement.] Without the cell quadrant or tower location, the Coast Guard may not be able to locate the caller in time to render assistance to the caller and his/her passengers.

Please release this call-identifying information to my search and rescue controller. If you have any questions, I urge you to contact your supervisor and legal counsel immediately. Time is of the essence.

Thank you very much for your cooperation.

Sincerely,

RELEVANT COMMANDING OFFICER
CAPT/CDR
U. S. Coast Guard

[1] 18 U.S.C. § 2702 (b) provides:

> A provider… may divulge the contents of a communication—
> (1) to an addressee or intended recipient of such communication or an agent of such addressee or intended recipient;
> . . .
> (3) with the lawful consent of the originator or an addressee or intended recipient of such communication, or the subscriber in the case of remote computing service;
> . . .
> (8) to a governmental entity, if the provider, in good faith, believes that an emergency involving danger of death or serious physical injury to any person requires disclosure without delay of communications relating to the emergency.

[2] 14 U.S.C. § 88(a) provides: "In order to render aid to distressed persons, vessels, and aircraft on and under the high seas and on and under the waters over which the United States has jurisdiction and in order to render aid to persons and property imperiled by flood, the Coast Guard may . . . perform any and all acts necessary to rescue and aid persons and protect and save property."

2.7.2 *CG Agreements/Routing of *CG Calls

In an effort to improve Search and Rescue incident response the Coast Guard has asked all wireless providers, *except those in Alaska*, offering a specialized keying sequence, such as *CG to reach maritime emergency assistance, to remove this feature. ***Any units holding a *CG agreement shall terminate the agreement.*** If any unit is unable to terminate the agreement with the cellular provider then refer that company to Commandant (CG-SAR), US Coast Guard.

The Coast Guard has requested that cellular companies begin work to reroute all *CG calls to the 911 Public Service Answering Point (PSAP) nearest to where the call originated, discontinue all active advertising, promotion and reference to the *CG service as a way to alert the Coast Guard for maritime distress, and to eventually eliminate the *CG service offering nationwide. Currently the *CG service is only available in Alaska.

2.7.2.1 Calls for assistance from other Regions. If a sector command center receives a call, distress or otherwise, from someone that is not in their region then determine the path the caller took to reach the contacted unit. For example, were they transferred from 911, the blue pages, *CG, or directory assistance. Once the path is identified and is not the fault of the caller, notify the operations officer of who was responsible for misdirecting the call so the responsible party can be notified of the proper routing of emergency maritime calls.

2.7.3 911

The Coast Guard must be proactive in ensuring that maritime distress calls to 911 are promptly routed to the appropriate command center. Sectors should liaison with all 911 services within their AOR to ensure they have appropriate check-sheets for maritime distress incidents and that they are aware of which Coast Guard command center they should be forwarding the calls.

Section 2.8
Alternate Means of Distress Notification

2.8.1 Distress E-mail and Text Messaging Policy

Some communication providers offer E-mail and text messaging capabilities. E-mail and text messaging are not designed for distress communication, and the CG does not endorse their use for distress alerting purposes.

(a) The CG will not provide E-mail addresses to the public for the purposes of facilitating E-mail distress alerts, and no CMDCEN or RCC shall be required to monitor E-mail for distress alerts.

(b) Although the CG does not endorse the use of E-mail or text messaging for distress alerting, all discernable distress alerts, regardless of format, shall be acted upon expeditiously by CG personnel.

(1) CG units that receive an E-mail or text message distress alert shall notify the appropriate CMDCEN or RCC by telephone.

(2) E-mail or text message distress alerts shall not be forwarded for notification purposes except as a follow-up to voice notification to a CMDCEN or RCC.

2.8.1.1 Telephone Policy. The commanding officer or officer-in-charge of each unit shall ensure personnel are proficient in handling telephone calls, particularly those of a distress nature, terrorist threat, or a bomb threat before assigning them the duty of answering telephones. In addition, if the CG unit cannot take action in response to a distress call, terrorist threat, or bomb threat, the commanding officer or officer-in-charge shall ensure personnel know how to relay the information to appropriate supervisors or authorities.

2.8.1.2 Distress Cellular Telephone Policy. Marine cellular telephone usage has grown rapidly, and an increasing number of boaters are relying on cellular telephones in conjunction with, or sometimes instead of VHF-FM radio. Cellular telephones are not considered a replacement for a VHF-FM radio.

(a) Important points to remember regarding cellular telephones:

(1) A voice call made via cellular telephone may be recorded on the SCC's DVL as long as the call is made to a distress telephone line. When properly used, cellular phones meet the requirements of reliable communication as outlined in this Addendum. Cellular telephone communications are point-to-point. Cellular telephone conversations cannot be heard by other boaters in the area who may be in a position to render immediate aid to someone in distress.

(2) Determining the geographic location of a cellular call is time consuming and requires close coordination with cellular service providers to identify the "cell" from which it was placed.

Section 2.9
Lost Communications with a Coast Guard Asset

2.9.1 Lost Communications Procedures

Chapters 8 and 9 of Reference (p) discuss communications requirements for Coast Guard vessels and aircraft. Communications schedules for operational cutters, boats, and aircraft are established by the cognizant Operational Commander (OPCON). The decision to initiate a Search and Rescue case following lost communications with a Coast Guard asset is also the responsibility of that unit's OPCON. This decision is a judgment call, but units should not wait to alert the SMC once a communication schedule is missed and subsequent attempts to contact the asset fail.

2.9.1.1 The following is taken from Chapter 9 of Reference (p) regarding Lost Communications with a Coast Guard Aircraft: ***"If the Aircraft Commander fails to check in on the primary or secondary frequency within five minutes of their communications schedule, the guarding station shall initiate an alert. The aircraft's parent command shall be notified first, followed by the cognizant District Command Center…."***

2.9.1.2 As with all search and rescue incidents, time is the enemy of a successful outcome. Lost Communication cases are essentially "overdues," but unlike most cases of overdue private vessels, the stringent communications schedule requirements of Coast Guard assets allow the SMC to proceed more rapidly through the Uncertainty to Alert to Distress emergency phases.

Section 2.10
Recorded Radio Transmissions and Telephone Lines

2.10.1 Guidance

2.10.1.1 The following guidance is taken from Chapter 6 of Reference (p):

Use of Recording or Monitoring Equipment

Coast Guard personnel, in the conduct of their official duties, shall not engage in clandestine, surreptitious, or other covert[1] use of telephone recording, listening, or monitoring equipment or aid or acquiesce in the use of such equipment.

Recording equipment is authorized for use at Coast Guard Command Centers, VTS, and COMMCEN units to record telephone or radio conversations since they primarily concern air safety, maritime safety, or SAR. The Coast Guard will not require beep tones or prior consent for the recording of calls.

Equipment installed on telephone lines only to provide a recorded announcement, voice mail service, or invite the caller to leave a message are considered office labor saving devices rather than communications equipment, and do not require approval.

Authorization to install and use monitoring equipment for situations not listed above must be obtained from the servicing legal office.

Inviolability of Information. The Coast Guard adheres to a policy of "inviolability" regarding the handling of wire or radio communication information. "Inviolability" means that no communicated information (including organizational messages, e-mail, and voice) will be released or divulged beyond the expectation intended by the originator of the information. Refer to Chapter 6 of Reference (p) for additional information on internal routing and readdressals.

The Coast Guard frequently intercepts communications from masters to owners reporting their vessel disabled, aground, or in a condition that indicates the possible need for assistance. The Coast Guard, in the performance of its duty to protect life and property at sea and along the coast, may properly act on this information and offer the services of the Coast Guard to the vessel in need of assistance. ***This information thus obtained shall not be released for publication.***

Broadcast messages without designation of address are addressed to all concerned and there is no restriction on their release.

2.10.1.2 ***Public requests for the release of recorded radio or telephone transcripts shall be referred to the applicable Servicing Legal Office***.

2.10.2 Recording Manipulation Software/Devices

In some instances the use of recording manipulation software/devices may be required to help determine the validity of distress, uncorrelated mayday, or hoax calls. The use of any recording manipulation software/devices is intended as a tool to help the SMC to make a logical determination for escalation and/or suspension of a SAR case where the caller's intent is uncertain. ***SAR case packages shall include a copy of the original unedited recording and***

a copy of the final edited version used to help make any escalation or suspension decisions.

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[1] Clandestine - concealed or hidden, especially for some illicit purpose; in an operation emphasis is placed on concealment of the operation; Surreptitious - to take away secretly; done, gotten, made, etc. in a secret, stealthy way;

Covert - concealed, hidden or disguised; in an operation emphasis is placed on concealment of the identity of the sponsor. *Source: DOD Dictionary of Military Terms as amended 17 March 2009*

Section 2.11
Ship Security Alert Systems

2.11.1 Background

The International Maritime Organization (IMO) Safety of Life at Sea (SOLAS) regulations mandate carriage of shipboard equipment called Ship Security Alert Systems (SSAS) for sending covert alerts to shore for vessel security incidents involving acts of violence (such as piracy or terrorism). The regulations went into effect 1 July 2004 for new passenger and cargo ships of at least 500 gross tons; existing passenger vessels and cargo vessels must have the equipment installed prior to the first radio survey after 1 July 2004 but before 1 July 2006. International guidelines do not specify the exact equipment configurations for SSAS; however, two common SSAS systems utilize the Search and Rescue Satellite-aided Tracking (SARSAT) and Inmarsat systems.

While not directly related to Search and Rescue operations, SSAS systems impose several unique procedural requirements and the potential for incidents involving dual or ambiguous alert involving both security issues and SAR response.

Vessel security incidents include all events that potentially compromise the safety of a vessel's crew or pose a potential security threat to other vessels or coastal states through acts of violence or terrorism. Annex J of Reference (o) provides specific Coast Guard policy guidance for actions in response to a variety of vessel security incidents. Ship Security Alert Systems provide one means of external alerting for a vessel security incident, but by their nature, require specific actions upon receipt by the Coast Guard in addition to the guidance in Reference (o).

2.11.2 Routing of Ship Security Alerts

The SSAS transmits a security alert to the Coast Guard either directly or via a communications service provider (CSP) indicating the security of the ship is under threat or has been compromised. The shipboard portion of the system is intended to allow covert activation without raising the alarm onboard or with other ships. ***According to IMO standards, flag states, upon receiving a ship security alert, must notify the coastal state in whose vicinity the ship is operating and authorities of other nations.*** Additionally, it is imperative that the flag state authority not attempt to contact the ship directly in order to preserve the covert nature of the alert.

As the recognized flag state authority for the United States, LANTAREA (RCC Norfolk) is responsible for receiving and initial actions resulting from Ship Security alerts. When a case involving a SARSAT SSAS beacon is passed from LANTAREA to another Coast Guard RCC, LANTAREA will notify the USMCC that subsequent SARSAT alerts for that case should be routed directly to the RCC that has assumed responsibility.

While communication service providers should always route SSAS alerts directly to LANTAREA for initial processing, there have been instances where initial SSAS alerts are routed to other command centers simultaneously or in lieu of LANTAREA. Upon receipt of a SSAS alert, command centers should immediately notify and forward the alert to LANTAREA.

2.11.3 Dual and Ambiguous Alerts

The nature of a ship security alert means the sending vessel is in a distress situation albeit due to a security threat. Through alternative means of communication (DSC, EPIRB etc), the distressed ship may endeavor to secondarily alert response authorities of their situation. ***In those instances where a vessel sends dual alerts or there is ambiguity as to the nature of their alert, LANTAREA, along with the geographically responsible command center shall make every effort to determine the status of the vessel without contacting the vessel directly. If after attempting to resolve the ambiguity it is unclear whether the vessel incident is either a search and rescue incident or a vessel security incident, operational commanders shall respond to the incident as a SAR case while using due diligence to ensure that responding resources are aware of the potential threat and must evaluate the situation once on scene.***

Section 2.12
U.S. Coast Guard Auxiliary Interpreters

2.12.1 Background

The USCG Auxiliary Interpreter Corps was established in 1997 to provide exceptional linguistics assets to any level of the Coast Guard. The Interpreter Corps consists of over 330 volunteer Auxiliary members who possess a high proficiency in 43 foreign languages. Of key importance is their familiarity with Coast Guard terminology and missions, important factors when needed for interpreting during operational missions. The Interpreter Corps is a ready resource for aid in conducting SAR missions when persons in distress do not speak or understand English (or only poorly) or when working with assisting foreign agencies or resources.

2.12.2 Accessing the Auxiliary Interpreter Corps

2.12.2.1 The listing of CG Auxiliary Interpreter Corps volunteers is accessed via the CG Intranet at http://cgwebs.net/interpreter/. On the main screen select "Search for Interpreter" in the left-hand menu bar. On the selection screen use the drop-down menus to select the desired language, city and state. A listing of interpreters will be provided based on your entries. If no interpreters are provided for your location, broaden the request. This may most simply be done by NOT selecting a city and, instead, selecting a state only.

2.12.2.2 The list of available interpreters resulting from your query will provide a variety of information about each individual. Of key importance are their availability, contact numbers and linguistic competency level. The linguistic competency level may be important depending on the mode of communication (spoken (phone, radio, etc.) vs. written (facsimile, email, etc.)) that is involved in the case. The linguistic competency levels are:

(a) Level "A" interpreter fluently reads, writes, speaks and understands a foreign language in addition to English.

(b) Level "B" interpreter speaks and understands a foreign language in addition to English, but does not necessarily fluently read or write in any language.

CHAPTER 3
SAR Operations

Section 3.1
Overview

3.1.1 SAR Incidents Profile

More than 95 percent of all Coast Guard SAR cases occur within 20 nautical miles of shore. Coast Guard helicopters and boats, our primary quick response assets, handle the majority of incidents to which the Coast Guard dispatches its own resources. Approximately 90 percent of all cases involve assistance or rescue only -- no searching. Of all cases, 8 percent involve minor searches (less than 24 hours) and 2 percent of all cases involve major searches lasting more than 24 hours.

While a total of only 10 percent of Coast Guard cases involve searches, the Coast Guard spends more than $50 million annually on these searches in operating costs alone. The condition of those in distress and the probability of continued survival degrades the longer assistance is delayed. Therefore, it is essential to reduce the time spent searching whenever possible.

3.1.1.1 Keys to reducing the time required for providing assistance include:

(a) Reliable and timely distress alerts;

(b) Accurate distress position reports;

(c) Rapid response with sufficient resources; and

(d) Efficient searching, detection, localization, classification, and identification.

The Search and Rescue Optimal Planning System (SAROPS), coupled with accurate environmental data, is an essential tool for planning efficient, effective searches in the coastal and offshore environments.

3.1.2 SAR Operations Stages

The success of a SAR mission often depends on the speed with which the operation is planned and carried out. The prompt receipt of all available information by the RCC is necessary for thorough evaluation of the situation, immediate decision on the best course of action, and a timely activation of SAR facilities. While no two SAR operations follow exactly the same pattern, SAR incidents generally pass through defined stages, which can be used to help organize response activities. These stages should be interpreted with flexibility, as many of the actions described may be performed simultaneously or in a different order to suit specific circumstances. SAR operations generally proceed through the five stages: *Awareness, Initial Action, Planning, Operations,* and *Conclusion.* The Planning and Operations Stages may be repeated as many times as necessary as a pair (plan, operate; plan, operate; …) to reach the Conclusion Stage.

3.1.2.1 **Awareness Stage**. The SAR organization cannot respond to an incident until it becomes aware that people or craft need assistance. Therefore, the public should be encouraged to report any abnormal occurrence that they have heard about or witnessed.

(a) A communications station usually receives the first information that a ship or other craft on the water is in distress. An RCC will often receive first notification that a ship or other craft is in distress from a communications station with which it is associated, or via its own communications facilities.

(b) The RCC must keep a complete record of information it receives. Pre-printed forms often are used to ensure that full information about the SAR incident is obtained and remains available for review.

3.1.2.2 Initial Action Stage. Once an RCC receives an initial report about persons or craft in distress, some immediate action often is appropriate pending receipt and evaluation of more complete information. RCCs usually have in their plans of operation a checklist of steps to accomplish for each type of incident with which the RCC expects it may become involved. After evaluating all available information and taking into account the degree of emergency, the SMC should be assigned, the appropriate emergency phase declared, and all appropriate personnel and facilities informed. Three emergency phases have been established for classifying incidents and to help in determining the action to be taken for each incident. These are the:

(a) Uncertainty Phase;

(b) Alert Phase; and

(c) Distress Phase.

Depending on how the situation develops, the incident may have to be reclassified. Frequent re-evaluation is a crucial function that the SMC performs during a SAR incident, particularly for overdue craft. All reports received before and during a SAR operation must be carefully evaluated to determine their validity, the urgency for action, and the extent of the response required. While evaluation of reports may be difficult and time-consuming, decisions must be made and action taken as quickly as possible. If uncertain information cannot be confirmed without undue delay, the SMC should act on a questionable message rather than wait for verification.

3.1.2.3 Planning Stage. Comprehensive planning of SAR response tasks is essential, especially when the location of the distress situation is unknown and the survivors move due to wind and water currents. Proper and accurate planning is critical to SAR mission success; if the wrong area is searched, there is no hope that search personnel will find the survivors regardless of the quality of their search techniques or the amount of their search effort. Safety concerns dictate that complete search (and rescue) action plans be provided to all participating facilities so each knows what to expect from the others. Planning of SAR operations requires proper training of the SMC and other RCC watchstanders. Computer use can eliminate much of the detailed work in search planning and can improve accuracy. While computers can be very useful tools, they can never eliminate the need for human intelligence and experience. In fact, a sophisticated computer-based tool like SAROPS requires more analytical thinking skills for its effective use than earlier, simpler tools did. In return, it can provide much better, more efficient and more effective search plans when properly used.

3.1.2.4 Operation Stage. The SAR operations stage encompasses all activities that involve searching for the distressed persons or craft, providing assistance and bringing them to a safe place. In this stage, the SMC assumes a monitoring and guidance role, ensuring that the search plan is

received, understood and followed by all SAR facilities. The RCC staff usually will spend most of this stage planning subsequent searches based on updated information and the assumption that the present search will be unsuccessful. ***Every effort shall be taken by the RCC to have a subsequent search ready prior to the completion of the current search patterns.*** Valuable time will be lost if the RCC delays subsequent planning waiting for the outcome of the current search or if they are not informed of deviations from the planned searches by the SRUs.

3.1.2.5 Conclusion Stage. SAR operations enter the conclusion stage when:

(a) Information is received that the aircraft, ship or persons who are the subject of the SAR incident are not in distress (False alert);

(b) The aircraft, ship or persons for whom SAR facilities are searching have been located, the survivors have been rescued and delivered to a place of safety, and all distressed persons have been accounted for (Case Closed);

(c) During the distress phase the SMC determines that further searches would be to no avail because further search efforts cannot raise the cumulative Probability of Success (POS) significantly (either the searching done so far has been so thorough that the probability of the search object remaining undetected is very small, or the search area has become so large and the probability density so uniform and thinly spread that even a huge search effort could not improve the POS significantly), or because there is no longer any reasonable probability of survival of the persons on board (Active Search Suspended Pending Further Developments).

3.1.3 Investigation: Data Collection and Analysis

SAR response is necessarily reactive in nature. The Awareness Stage is generally initiated by some event that alerts the SAR System to the existence or possibility of a SAR incident. Examples of such events include distress broadcasts from distressed craft, reports of emergency beacon activation, sudden severe weather in areas known to be populated with vessels that could be endangered by it, etc.

Often information is incomplete about an incident or potential incident when the Awareness Stage is initiated. Therefore, it is incumbent upon all SAR personnel involved, but especially the SMC, to continue investigative efforts to learn as much as possible about the incident and related matters. These investigative efforts must continue at least until the case conclusion (closed or active search has been suspended pending further developments). If a case study is done, then investigative efforts will continue until the case study has been completed. Investigative efforts require good interviewing skills to obtain pertinent information from reporting sources and good analysis skills to piece together the facts and data obtained in order to develop one or more consistent, coherent "pictures" or "scenarios" of what may have happened to the survivors. There are a variety of tools and aids for investigation, including data collection forms, historical summaries and knowledge of past similar incidents. Methods for gathering more information include following leads, identifying and interviewing additional potential reporting sources who may have pertinent information about the distressed, missing, overdue, or unreported craft and/or its passengers and crew, communications searches, etc. These investigative methods should be used throughout the

prosecution of the case. Active searching on scene using visual and electronic sensors is also an investigative technique, but it is a highly specialized and very expensive method that requires a significant amount of planning and coordination to be effective. However, it may be the only way to successfully resolve the case and save lives. It is important to understand that searching is done in addition to, not instead of, other investigative activities.

3.1.4 SAR Incident Data Collection: The Watchstander's "Art"

The collection of accurate, detailed incident data upon notification of a potential distress is a crucial element of the Awareness stage of a SAR incident. For example, communications with people in distress may be terminated abruptly, and the initial information collected may be the only means to affect a successful search and rescue effort. Despite this, the time taken to collect all of the information on the SAR incident checksheet could delay the Coast Guard's initial response and could unnecessarily put those in distress at greater risk. When responding to calls for assistance, watchstanders should focus on initially collecting only the most critical and relevant information necessary to determine the severity of the situation and an appropriate response. Usually, this information consists of the items on the Initial SAR Incident Checksheet: vessel's position, number of persons on board, vessel's description, and nature of distress. For most cases, this will be sufficient information to determine an appropriate initial response and dispatch resources to assist. Those in distress should then be notified as soon as Coast Guard or other resources are dispatched, so that they know that help is on the way. Once these steps are completed, watchstanders can then continue the process of completing the Initial SAR Incident Checksheet, and any supplemental checksheets as necessary.

3.1.4.1 The ability to effectively communicate with persons in distress requires both skill and experience. Mariners whose stress level is high may speak quickly or incoherently; resulting in crucial information being passed that is not easily understood. Coast Guard radio watchstanders must be acute listeners and clear speakers. Watchstanders who speak in a clear, calm voice can often reduce the stress level of those with whom they are communicating. This in turn can help ensure that crucial information passed by the boater is more easily understood.

3.1.5 Standard Checksheet Formats

The use of SAR incident checksheets for the collection of SAR case data is required. The standard formats for Coast Guard SAR Incident Checksheets are provided in Appendix G. These sheets detail the minimum information to be gathered for each situation. However, the primary goal of gathering information is to reduce uncertainties about the survivors' location, status, and intentions as much as possible. Therefore, obtaining any and all available additional information related to these topics is strongly encouraged.

3.1.5.1 Use of these standard formats is strongly recommended. Modifications in format, or the creation of additional data fields, are authorized as deemed necessary by the operational commander to accommodate local practices. ***Modifications shall not eliminate information to be collected.***

3.1.5.2 ***The Initial SAR Incident Checksheet shall be completed for all incidents.*** The Supplemental SAR Checksheet contains other information that should be collected as circumstances warrant. Standard checksheets are also provided for specific incident types.

3.1.5.3 ***SAR Controllers shall not hesitate to launch resources prior to completing the checksheets.*** If the situation dictates, launch first then make all attempts to complete the checksheets as time permits.

3.1.5.4 While completing the checksheets, SAR Controllers should ascertain if personal flotation devices are being worn by persons on board at the specific points indicated on the sheets and advise the reporting source of the Coast Guard's intended actions.

3.1.6 Search Planning

There are basically only two methods for planning searches—manual and computer simulation. The manual search planning method is found in Volume II of Reference (b), the *International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual*. Although there are several computerized versions of the manual method (sometimes with slight variations from *IAMSAR*) in use in various parts of the world, they are not fundamentally different from the manual method itself. In some cases these computerized versions of the manual method have access to more detailed environmental data than is normally associated with paper-and-pencil methods, but otherwise the computer is simply being used as a tool to perform the same computations and display the same results the paper-and-pencil manual method would produce. Consequently, the quality of the results often is not substantially better than could be obtained with pencil and paper. The USCG's search-planning tool, SAROPS uses a simulation approach. The main advantage of simulation is that it allows a more realistic representation of real-world complexity than the grossly over-simplified manual method at all stages of the search planning process.

3.1.7 Uncertainty, Probability, and Probability Density Distributions

Searching necessarily involves uncertainty. If the search object's location were known or could be accurately predicted, no searching would be necessary. Therefore, the first uncertainty the search planner must deal with is the object's location at the time SRUs can be on scene. This involves uncertainties about the pre-distress movements of the distressed craft with consequent uncertainty about the time and location of the distress incident, uncertainty about the types of objects (disabled craft, PIW, raft, etc.) that may be adrift, and uncertainty arising from conflicting or incomplete information given rise to two or more possible scenarios. A scenario is an event or chain of events that describe a possible incident or the pre-distress motion of the distressed craft leading up to the incident. When describing a scenario, the pre-distress chain of events will be described using the conjunction 'and', as in the Fishing Vessel left port and then traversed to the "North" fishing grounds and then possibly left for a port "A". If the conjunction "or" is used, then be alerted that a second scenario is required to capture all the possible scenarios or uncertainties around the possible incidents. For example; the Fishing Vessel left port and either traversed to the 'North' fishing grounds or the 'South' fishing grounds; then two scenarios are required since giving the available limited information both scenarios are possible (North or South), but the fishing vessel could not have done both. Even when these are known within close limits, if a significant amount of time will pass between the time of a distress and the arrival of resources on scene, uncertainty about the object's location will grow due to uncertainties in the available data about the environmental factors that cause drift, and uncertainties in knowledge about how the search object will

respond to those factors. In addition, detection of the object once resources arrive on scene and begin searching is by no means certain. These uncertainties require the search planner to think in terms of probabilities and relative likelihoods (also known as probability *weights*) such as A is "very likely" while B is "unlikely." On a scale of 0 to 10 where 0 is "Ignore" (almost never happens) and 10 is "Almost certain," A would be scored as "9" and B would be scored as "3," making A scenario or search object type three times as likely as B. *Weights* are generally used when describing the relative likelihoods of competing scenarios or the relative likelihoods of different search object types within scenarios. After scenarios, subsequent drift, and any previous searching have been evaluated and the time has come to plan the next search, the three probabilities of primary concern are:

3.1.7.1 The probability that the search object will be in some bounded area (probability of containment or POC) when search facilities can be on scene searching.

3.1.7.2 The probability that the search object will be detected; assuming it will be in an area during the time the area is searched (probability of detection or POD).

3.1.7.3 The probability of finding the search object (probability of success or POS) based on both the POCs for the areas searched and the PODs from searching those areas.

3.1.7.4 This is a simplistic view since the true situation is very dynamic. Search objects in the marine environment are almost always in motion due to drift forces. This means that for any fixed area, the POC value changes continuously. The act of searching itself causes changes in POC values since, according to the Rule of Bayes, searching a region without finding the search object reduces the POC estimate for that region and increases the POC estimates for other, unsearched, regions. However, this simple model is useful for illustrating some basic concepts.

(a) The first concept is that for any given search area,

$$POS = POC \times POD .$$

For non-overlapping search areas that are covered more or less simultaneously, the total POS is simply the total sum of all the POS values for the individual search areas. The cumulative POS (POS_{CUM}) is the probability that all searching done to date would have located the search object.

(b) The second concept is that there is always a tradeoff between POC and POD. For a given level of search effort, increasing the size of the search area to include more of the possible search object locations will increase POC, but the POD will be decreased because the effort will be more thinly spread giving a lower coverage factor. Going the other way, decreasing the size of the search area will reduce the POC but will increase the coverage factor and POD. Finding the search area(s) to cover with the available effort so that POS is maximized is called optimal effort allocation.

3.1.8 The Goal of Search Planning

The ultimate goal of search planning is to find the survivors of a distress incident as quickly as possible. The way to achieve this goal is to increase the cumulative probability of success (POS_{CUM}) as quickly as possible using available and assigned resources. "Optimal effort

allocation" is the process of finding the combination of search area, coverage, and resource assignments that produce the most efficient search plan. This is a mathematically complex process that requires a sophisticated computer program. The manual method found in Reference (b) produces "near-optimal" search plans based on a number of simplifying assumptions and corresponding "optimal search factors". Unfortunately, the extreme degree of simplification required often produces results that are not a very good match for the real-world situation. However, SAROPS does a much, much better job of modeling real-world complexity and generally produces much more nearly optimal operationally feasible search plans than any other method. That is not to say that SAROPS is "perfect" or that its results cannot be improved upon by applying some additional human thought processes and analysis. SAROPS recommendations should always be carefully reviewed for practicality and sensibility.

Section 3.2
Search Planning Methods and Tools

When developing a search plan, search planners must be detectives and information distillers. They must aggressively pursue leads and obtain all information available. They must continually think "outside the box."

Coast Guard search planners shall plan searches in one of two ways, subject to the guidance provided in this chapter: With SAROPS (preferred primary means) or manually in accordance with Reference (b) and Appendix H to this Addendum. Each of these methods is discussed in more detail below, along with their capabilities and limitations. Further guidance on usage is also provided.

3.2.1 Historical Background

Search theory is the scientific study of mathematical methods and algorithms for developing optimal search plans. It is one application of a branch of the applied science known as *operations research,* and it was developed by the U. S. Navy during World War II to aide in searching for enemy submarines and finding downed Allied fliers adrift on the ocean. In both areas, operationally practical methods were developed from the scientific theory and used to good effect. Today's manual search planning method is a direct descendant of these early methods. The digital computer has provided the tools to greatly enhance the effectiveness of these methods.

3.2.2 Planning Searches Manually

The *IAMSAR Manual, Volume II,* provides the basic guidance and worksheets for planning searches manually. This method, with the modifications described in Appendix H, is the approved standard for manual search planning in the U. S. Coast Guard. This method requires and depends only on resources and data that are either locally available or can be obtained and entered by the search planner. ***All USCG personnel who fulfill SMC/RCC responsibilities shall be familiar with the IAMSAR Manual search planning methods and modifications described in Appendix H of this Addendum.***

3.2.2.1 ***SAROPS is the preferred method for planning searches and shall be used whenever it is feasible to do so.*** It is designed for use in both coastal and oceanic environments, and in the Great Lakes. At present, use of SAROPS is impractical in rivers and small enclosed or nearly enclosed bodies of water. In the very unlikely event that SAROPS will be unavailable to a Coast Guard command center for any significant period of time, that command center should consider passing its SMC responsibilities, at least for cases requiring search planning, to another command center with SAROPS capability. If SAROPS is unavailable and passing SMC duties to another command center is deemed impractical, then the manual method may be used for planning coastal, oceanic, or Great Lakes searches when:

(a) The distress incident time is known within plus or minus one hour,

(b) The region of possible distress locations is best described by a position and the probable error about that position, and

(c) The commence search time is less than 24 hours after the distress incident.

3.2.2.2 ***If the distress occurs in restricted waters such as smaller bays and estuaries that are nearly enclosed, rivers, lakes other than the Great Lakes, etc., until SAROPS capability is expanded to include these special areas, the search must be planned manually using the guidance provided in Appendix H. However, the SAR Tools portion of SAROPS shall be used to create, plot, and document search patterns and other case-related geographic information as appropriate.***

3.2.2.3 ***The full SAROPS suite shall be used whenever the above conditions are not met.*** For simple situations in reasonably open waters, both methods should produce similar results; SAROPS however provides advantages that make it the appropriate choice in all situations where it can be employed. Further information, guidance and cautions are provided in Appendix H.

3.2.3 Planning Searches with SAROPS

3.2.3.1 ***SAROPS shall be used to plan searches whenever the criteria given above for using the manual method are not met.*** Further information, guidance and cautions are provided in Appendix H.

3.2.3.2 SAROPS is available to all Area, District, Sector Command Centers in the Coast Guard. It is hosted on approximately 16 servers around the Coast Guard. All Command Centers with RCC responsibilities have access to all SAROPS servers, so the system is quite robust. If a Command Center's normal SAROPS server is down or otherwise inaccessible, another server may be used. SAROPS is implemented as a set of extensions to the ArcGIS®-based Common Mapping Framework-Lite (CMF-L) geographic information system (GIS) software. Raster nautical charts, satellite imagery, and many, many other digital GIS products may be imported into CMF-L and viewed as "layers." However, users should be prudent in their use of this capability since importing many complex layers will tend to cause excessive server and network loading and will adversely impact system performance and responsiveness.

3.2.3.3 All SAROPS servers obtain surface wind and surface current environmental data from the Environmental Data Server (EDS) hosted at the USCG Operations Systems Center (OSC) in Kearneysville, WV. The EDS is accessed via CGDN+, the Coast Guard's private data network. The EDS maintains global and regional gridded surface wind and sea surface current databases that are updated from one to four times daily (depending on the specific source and data product posting schedule). Updates are based on near-real-time outputs from circulation models run by NOAA and the U. S. Navy. In addition, a traditional static database of seasonal climatological average sea current data is available. Tidal currents are computed from a standard tidal current model. Although these two data sources appear in the EDS list of available products, they actually exist on each SAROPS server and are available even if the EDS or connectivity to it is down. All EDS-listed data may be accessed and viewed either from CMF-L independently of any active SAROPS cases, or as part of an active SAROPS case.

3.2.3.4 SAROPS uses a Monte Carlo (a.k.a. "particle filter") simulation approach to support the search planning function. The manual method computes only one or two drift trajectories ending at one or two "datums" and then assumes the possible search object positions are distributed around those datums according to one particular type of statistical distribution known as a circular bivariate normal distribution. SAROPS, on the other hand, generates thousands of

simulated search objects (particles) according to one or more "scenarios" described by the search planner. A SAROPS case may contain as many as four distinct search object types simultaneously to handle situations where the actual search object may be any one of the chosen one to four types. For example, a MAYDAY report is received from a vessel but communications are then lost and it is not known whether the search object is the vessel disabled and adrift, a life raft, or a person in the water. To simulate search object drift, SAROPS draws independent random samples from the wind, current, and leeway data for each particle, computes corresponding independent drift trajectories and then "maps" the resulting positions as a probability grid. Instead of using average wind and current values over the entire drift interval as the manual method does, SAROPS moves each particle in short time steps (presently every 20 minutes), obtaining wind and current data from its databases at every step based on the particle's computed position and the time on the simulation clock. SAROPS also recognizes land features using a vector shoreline database that closely, but not exactly, matches the shoreline shown on nautical charts. The user has the option of making the SAROPS shoreline data visible so it may be compared with the base map and nautical charts. These features provide more general, and more realistic, distributions of possible search object positions than those assumed by the manual method . SAROPS can represent distributions of initial distress positions and times around a position, within an area represented by corner points of a polygon, or along the intended track of a voyage/flight. Legs of a voyage/flight may begin or end at a position or an area (such as a fishing area). The manual method is designed to handle only known distress positions and times well, and then only when the uncertainties are relatively small and the environment is essentially uniform over the area of interest.

3.2.3.5 In addition to simulating search object drift and producing a probability grid of more likely and less likely locations, SAROPS also has an optimal search planning module. This "Planner" module accepts as input data necessary to estimate sweep widths, as well as data to describe each search facility and it's on scene endurance. Planner then attempts to perform a "constrained optimization" that maximizes the POS while assigning a search area to each search facility that exactly consumes all of its available on scene endurance and ensuring that search areas do not overlap. Importantly, SAROPS accounts for the simultaneous motions of search facilities and search objects during the search, both when planning searches and later when evaluating search results. SAROPS also accounts for the effects, on each of the thousands of simulated search objects, of prior searching when estimating values for POS, cumulative POS, and POCs for probability maps. SAROPS takes these effects into account when making optimal search plan recommendations for subsequent searches. The manual method cannot do this, although it does use another technique based on extensive simplifications to develop search area recommendations.

3.2.4 Amver System

Although it is not a search planning system, Amver is a computerized system for maintaining the dead reckoning position of participating vessels worldwide and is therefore a valuable resource for finding search and rescue facilities near a distress incident, especially one that occurs in a remote offshore location. Merchant vessels, including some commercial fishing vessels and mega-yachts, of all nations making coastal and oceanic voyages are encouraged to send movement reports (sailing plan, periodic position updates, and final report) to the Amver Center at the OSC via assigned coast or international radio stations or satellite service

providers. Norway, Poland, and the U.S. (for certain vessels) require their merchant vessels to participate; other vessels participate voluntarily. The information is stored in the database at the Amver Center and used for SAR efforts. Recognized RCCs worldwide handling an oceanic SAR operation can request Amver information from any U.S. Coast Guard RCC. Amver is accessed via CGDN+. Amver information is available to RCC/RSC SAR planners in three categories.

3.2.4.1 **Surface Picture (SURPIC)** is a program that identifies and plots Amver vessels worldwide. This is especially useful in the event of a maritime emergency. RCC input includes the distressed vessel's position, type and time of SURPIC. Output is a text list of the closest vessels within a defined area and a selected subset of available vessel information. A graphic display of the information is available for U.S. Coast Guard RCCs. SURPIC information can be faxed or e-mailed to a foreign RCC requesting help. SURPICs can be generated for the current time, a point up to 30 days in the past, or a point up to 14 days in the future. The three types of SURPICs are:

(a) **Radius SURPIC:** A surface picture defined by a distress position, a distance from the distress position (radius), and a Date Time Group (DTG) for the SURPIC.

(b) **Rectangle SURPIC:** A surface picture of a specific area defined by a northwest corner and a southeast corner, and a DTG for the SURPIC.

(c) **Trackline or Snapshot:** A surface picture defined by the starting and ending position of a trackline, a distance from the trackline, and a DTG for the SURPIC. This SURPIC is useful in determining which vessels will be in a given area at a certain time (e.g., a space shuttle launch, an aircraft that may have to ditch, or an overdue vessel on a known course).

3.2.4.2 **Lloyd's Vessel Data:** The Lloyd's Vessel Data displays static information from the Lloyd's Registry describing the vessel such as: vessel name, international radio call sign, the Inmarsat number, Lloyd's number, hull ID (official number of registry)**,** length, width**,** the year and month in which the vessel was built, and the true and registered nationality and address of the owner company. Data on tens of thousands of vessels are obtained from Lloyd's and updated monthly.

3.2.4.3 **Voyage Information:** Includes information on the current voyage; the vessel's current predicted position; a record of the most recent Amver reports received; and Amver and Lloyd's vessel data.

3.2.5 Commence Search Point and Pattern Orientation Guidance

All factors, including safety, endurance, projected survival times, navigation, environmental conditions and available resources, should be carefully considered when determining the orientation of search patterns and placement of commence search points.

3.2.5.1 A sample of factors to consider includes:

(a) When expected survival time is short, the decision may be made to place the commence search point at the datum position so as to put the SRU as close to the expected position of survivors as early as possible. Another alternative is to ensure the first search leg of the pattern passes through or over the datum position, placing the CSP accordingly.

(b) The resource's (includes aircraft, small boat and other available assets) proximity to the search area. The decision may be made to place the CSP at the point closest to the SRU's departure point in order to facilitate the start of searching as quickly as possible.

(c) The decision may be made to place the CSP at a point farthest away from the departure point, so as to have the SRU finish its search as close to its recovery point as possible. This addresses other considerations, such as: having the SRU pass through datum prior to searching; inserting a SLDMB at datum prior to searching; and having the SRU finish its search as close as possible to a base intended as a staging point for subsequent searches.

(d) For missions with multiple air SRUs, all CSPs and search pattern orientations should be coordinated so that all aircraft on scene during the same periods of time are creeping in the same direction so as to assure horizontal separation. ***Vertical separation of at least 500 feet must also be assured by assigning different search altitudes to aircraft that are in adjacent search areas at the same time.*** Strict adherence to these rules is paramount to risk assessment and safety of flight issues. It may also be appropriate to consider horizontal separation for surface assets in situations where visibility is reduced (fog, night, and heavy precipitation).

(e) A poor choice of pattern orientation can significantly reduce search effectiveness. For example, a PS pattern where the direction and rate of creep match the direction and rate of the search object's drift during the search is almost completely ineffective and has little chance of success.

(1) In manual search planning, it is generally recommended that search legs be oriented parallel to the expected direction of drift to minimizes pattern distortion relative to drifting search objects.

(2) SAROPS, on the other hand, examines the effects of relative motion when evaluating different choices for CSP and pattern orientation. Often it is able to take advantage of relative motion effects in ways that are impossible with manual computation, resulting in patterns where search legs are not parallel to the expected average drift direction.

(3) Search planners are encouraged to view SRU movements through their respective patterns and compare them with the moving/changing probability grid and/or moving particles underneath those patterns by using the Time Slider or Animation features.

(4) Search planners are also encouraged to re-orient the patterns recommended by Planner, evaluate them, compare their POS values with the originals, and use the patterns that produce the highest POS values.

(f) Other orientation considerations include the direction of the sun, especially early and late in the day and the direction and size of the swells. Looking into the sun makes detection very difficult and small objects such as PIWs and rafts can sometimes be obscured from view while in the trough between large swells.

3.2.5.2 There are many, sometimes conflicting, factors to consider prior to making a final decision about where to place the CSP. Each SRU should carefully evaluate the search action plan to ensure commence search points and pattern orientations for the assigned sub-area and those for adjacent assignments meet safety requirements and provide the best opportunity for detecting

the search object. ***The SMC must be notified immediately upon discovery of any safety issues and should be notified of all other apparent deficiencies as early as practicable***. Although communications between the OSC and SMC should always be immediately available, OSCs are usually authorized in the search action plan to make necessary changes as long as the SMC is informed.

3.2.6 Search Area Designation

Extended search activities are often done in "epochs" of time. For example, a search involving several facilities is planned and a search action plan with specific taskings for these facilities is promulgated. Planning for a subsequent search then begins so that it may be implemented quickly should the present search effort fail to locate the survivors. The two periods when facilities are on scene would form two search epochs. ***Search epochs shall be designated with letters (A, B, C…) where a letter is assigned to each epoch in time sequence. The first planned search epoch shall be designated "Alpha," the second "Bravo," and so forth.*** The letter designator also applies to the overall search area for the corresponding epoch. ***Individual search sub-areas within an epoch shall be designated with numerals following the letter designator (A-1, A-2, etc.). If an individual search facility's assignment spans two or more search epochs, it shall be named for the search epoch for which it was planned.*** For example, if an Alpha search is planned for two helicopters and one HC-130, then all three will carry the "Alpha" label, even though the HC-130 may still be on scene when a subsequent search involving other helicopters or crews takes place. However, if the Alpha search was planned for only two helicopters, and a "subsequent" search was planned for another helicopter and a HC-130, but the HC-130 could be on scene before the Alpha search was actually completed, the HC-130's assigned sub-area would receive a "Bravo" designator. For search planning and search area/sub-area designation purposes, it is also permissible to divide single physical sorties into parts at epoch time boundaries chosen by the search planner. Thus, in the first example above, the HC-130's on scene endurance for Alpha search planning purposes might be only half its actual on scene endurance, while the other half would be included in planning for the Bravo search.

Searches that are part of the initial response and are, in some sense, unplanned, may or may not be named according to the above conventions. Their effectiveness also may or may not be considered when planning subsequent searches. Generally such searches are very localized and do not involve large amounts of effort. Sometimes such searches are not very effective due to weather, limited visibility, darkness, etc. The search planner will have to decide whether to assign designators and/or include their negative results when planning subsequent searches.

No matter what scheme is used, there will be situations where it is not clear how an epoch/area/sub-area should be designated and reliance will be placed on the search planner's judgment.

Section 3.3
Search Planning Considerations

3.3.1 General

The goal of search planning is to deploy the available resources in the best way possible so as to maximize the probability of success (POS) as quickly as possible. A search plan that achieves this goal is called "optimal." Minimizing the time required to achieve the maximum possible POS with the available resources is very important to the saving of lives since the prospects for continued survival following a distress incident often decline rapidly with the passage of time.

3.3.1.1 The basic problem of optimal search has the following mathematical and statistical elements:

(a) A probability density distribution on search object location (so the probability of containment, POC, for any subset of the possible locations can be estimated),

(b) A detection function relating the probability of detecting (POD) the object if it is in a searched area to the density (coverage) of the searching effort expended there,

(c) A known finite amount of available searching effort, and

(d) An optimization criterion of maximizing probability of finding the object (POS) in the minimum time subject to the constraint on effort availability.

3.3.1.2 **SAROPS**. The SAROPS probability grid, computed from the distribution of particles and their respective probabilities of not having been detected by prior searching, represents the first element. For the second element, SAROPS contains the necessary tables and algorithms for determining the appropriate sweep widths and corresponding detection functions based on the user's inputs of search object descriptions, environmental parameters affecting detection, and search facility parameters (type, sensors, etc.). SAROPS addresses the third element by computing the available searching effort from the user's inputs describing the search facilities, search speeds, on scene endurances, etc. Finally, for the fourth element, the Planner module seeks to find the best search plan it can within its allotted computing time, where the plan with the highest POS is judged to be the "best."

3.3.1.3 **Manual Method.** The manual method also addresses each of these elements, but manual computation requires so much simplification that it works adequately only in the simplest of situations. The manual method has difficulty with anything more complex than a single known distress position and time in an area where averaged wind and current vectors accurately represent the environmental situation over the entire area and time of interest.

3.3.2 Improving Likelihood of Locating Search Objects Quickly

Search planning is based on a myriad of variables including environmental factors, the nature of the distress incident, the possible search object(s), and the available search platforms and their capabilities. Search planners can improve the likelihood of locating search objects quickly by doing the following:

3.3.2.1 Obtaining, correlating and analyzing all information, including lines of bearing/range rings from receiving stations that may be relevant, any germane local knowledge, any hazardous

conditions (e.g., weather, shipping lanes, condition of the distressed craft, shoals/reefs/rocks), etc., that may be related to the distress incident. The objective is to establish:

(a) The distress time and position or range of possible times and positions as accurately as possible,

(b) The type(s) of search object(s) that may have resulted from a distress incident.

3.3.2.2 Selecting the most appropriate available environmental data for estimating the search object's drift within the general search area. Early deployment of one to several SLDMBs should be given very serious consideration whenever there is significant potential for an extended search.

(a) Determining the availability and capabilities of search and rescue units (SRUs) and other potential search facilities. In general, it is both more effective and more efficient to deploy/employ sufficient search facilities to make an early successful conclusion highly probable, rather than use a more limited response in the hope that no more resources will be necessary or that gradual escalation will minimize the commitment of resources.

(b) While it would be both impractical and imprudent to commit every available resource to every SAR incident, committing more than the bare minimum required for a "best case" scenario generally saves both more lives and more resources in the long run than a more gradual approach.

(c) ***Every SAR case is different so RCC watchstanders must exercise sound judgment when deciding upon the scale of the response.*** Watchstanders should bear in mind that situations requiring SAR responses can only get larger and more complex with the passage of time until the survivors are found and rescued.

3.3.2.3 Including additional search criteria within the search plan based on local knowledge.

3.3.3 Initial Conditions

The initial data, estimates and assumptions on which a search plan is based, often determine whether a search will be successful. Therefore it is necessary to establish the time and position of the distress incident as accurately as possible. Sometimes this is quite easy, as when a craft accurately reports its position at the time of the distress. ***At other times, such as when a craft is unreported or overdue, a substantial investigative effort must be initiated and maintained throughout the case until the survivors are found or active search is suspended pending further developments. In addition, the pre-distress movements of the craft must be considered in order to properly match possible distress positions with possible distress times.*** SAROPS can be very helpful in this regard providing the structure to handle the various scenarios' inputs and a means to weight the various scenarios.

3.3.3.1 Very often there is insufficient information to establish exactly where and when a distress occurred, even when a craft reports itself in danger. In cases of overdue or unreported craft, there is often conflicting information, especially in the early stages. ***In such situations, the search planner must develop scenarios that describe what may have happened. Such scenarios must be consistent with a substantial subset of the available information.*** If one scenario is not consistent with all the available information, additional scenarios should be considered and constructed to account for remaining available information. ***Assumptions must be made to fill gaps in the available information and complete each scenario. Known facts***

must be clearly labeled as such. Even more importantly, assumptions must be labeled and treated as such. Otherwise, an assumption that is made early and repeated often may take on the appearance of fact and cause a serious misdirection of response efforts. Scenario development and analysis require careful thought and sound judgment, taking care to avoid jumping to unwarranted conclusions or becoming fixated on only one of several possible scenarios (a.k.a. "scenario lock," a form of "tunnel vision"). The development and subsequent weighting of all the possible scenarios is the key and critical element that the search planner brings to the SAROPS planning tool.

3.3.3.2 Uncertainty estimates associated with the distress incident have a large impact on the size of the area that must be searched. ***The search planner must always bear in mind that the uncertainty associated with any piece of data is a reflection of how much total confidence may be placed in it.*** The nominal accuracy of the method or device used for fixing or estimating a position is the *minimum* probable error of position that should be considered. Although these values are available for selection in SAROPS, the search planner should not automatically assume they are the most appropriate values to use. Other factors that may increase the probable position error used for planning the search should always be considered.

(a) For example, if the *Mary Jane* reports itself in distress and taking on water "50 miles southeast of Cape Fear" based on a GPS fix, that does not mean the quality of the information as reported is as good as the average quality of GPS positions. It would be more prudent to assume the range and bearing given were only approximate, possibly an estimate made by eye from a nautical chart while the reporting source was under stress. The resulting uncertainty about the distress position would then be much larger than the uncertainty associated with GPS navigation in general.

(b) Reporting source stress can cause other, more subtle problems. For example, there have been several occasions when persons in distress reported very precise GPS-derived positions that were actually waypoints far from their current location that had been entered into or recorded by the GPS device at some earlier point in time. Consideration should be given to the delay between the time of incident (e.g. man overboard) and the time a navigational fixed can be taken, since during that time delay the vessel will have moved away from the man overboard.

(c) Although GPS positions can be very accurate when GPS receivers are used properly, that accuracy can significantly differ from the accuracy of other parts of the search planning system. Even though the environmental data products available to SAROPS are generally much more accurate and comprehensive than historical averages, they are derived from computer models and their gridded wind and current values may be slightly displaced from real-world locations. For example, the model-based location of a specific feature such as the north wall of the Gulf Stream or an eddy that has spun off from the Gulf Stream may be offset from the actual location by one or two grid points due to modeling error. Assuming a very small initial position error (X) based on GPS positioning might not allow the initial distribution of particles to sample from the true range of possible surface currents whereas a larger X uncertainty value would.

(d) For all of the above reasons, search planners should be extremely cautious about relying too much on the high degree of accuracy that is possible for reported positions when high-

precision navigation is in use. An accurate position with little uncertainty is highly desirable for rescue missions, but such small uncertainties are not necessarily the best thing for search planning purposes. When search planning becomes necessary, some additional allowance in the X uncertainty should be considered for unanticipated sources of uncertainty. Very small initial position errors are discouraged for maritime search planning purposes, especially off shore. Exceptions to this rule of thumb include:

(1) Accurately known voyage/flight departure and destination positions. Intermediate waypoints are not exceptions since, even with very precise navigational capabilities, there is no guarantee that the operator of the craft would necessarily get as close as possible to those planned waypoints while en route; and

(2) Areas where the currents and winds are fairly homogeneous (i.e. do not vary significantly over a fairly wide area). More accurate navigational/position information based on the method used to determine the position can be reasonably assumed in these situations when the search planner has a high degree of confidence in the ability of the distressed person(s) to competently use the reported method.

(e) In all situations, when searches are unsuccessful, the entered position information is one of many factors where adjustment may be appropriate during the examination and trial of alternate scenarios.

3.3.3.3 There may also be uncertainty in exactly what is the object of the search. SAROPS contains a hierarchal pick-list of search objects that have known leeway drift characteristics. The pick-list is presented from the general to increasingly more specific categories of search objects. When a search object is chosen, SAROPS assigns to each particle in that object class, its own unique leeway coefficients for the leeway equations. The spread of those coefficients is greater for the more general classes than the more specific classes. The spread is also a function of the underlying quality of the background study conducted for that particular class of search objects.

(a) Choosing the most specific category of the search object or search objects for which the controllers has information will result in the most realistic leeway drift equations being applied and establishing the best estimation of probability density distribution during the time of searching.

(b) Up to four (4) search objects can be chosen in SAROPS. The search objects can be weighted independently for each scenario from zero (Ignore completed) to ten (Highly Likely). If additional information becomes available during the course of the case, a more specific search object category maybe chosen or a category may be eliminated from consideration for searching. Using a zero weighting is sometimes useful in these cases as it will help document a previous choice or that the object used to drift and help develop the scenario but is not the object of the search.

3.3.4 Drift Theory

On average, the Coast Guard conducts more than 5,000 searches annually, at a cost of about $50M. A fifth of the searches continue longer than 12 hours. In longer searches, knowledge of the drift of the search object becomes very important to the search planner. If the search object is not in the region covered by the search, there is no chance of finding it. Thus, the

better the drift of an object is known, the more likely it will be found. Shortening the search increases the probability that the person(s) in distress will survive. Survivors and their craft are small solid objects suspended at the often-turbulent interface between two huge fluid masses - the ocean and the atmosphere. The forces of these two entities exerted on the search object cause drift. When there is no wind, objects will move with the current. When wind is present, it has two effects. First, friction with the water surface creates waves and alters the surface current. Second, the wind acting on the exposed surfaces of the object creates leeway. Drift is estimated as the vector sum of the total water current (including any contributions from wind stress on the water's surface) and the leeway as described in Section H.3.4.

3.3.4.1 Datum Marker Buoy (DMB). Datum Marker Buoys (DMBs), both radio and self-locating, are tools for determining total water current in a search area. When using DMBs, search planners should use their best judgment to estimate the sphere of influence for which the DMB information is valid. The sphere of influence is smaller in the vicinity of high currents; i.e., the Gulf Stream, Florida Straits, or known variable current areas such as Georges Banks off of New England. Time is also a consideration. Marine science experts, such as those at the International Ice Patrol (IIP), are available to assist in estimates. As a rule, the sphere of influence should be no larger than that for water current information already available, such as the environmental information provided to SAROPS from EDS. Since on scene ocean currents are so poorly known and hard to predict, the Coast Guard uses DMBs to provide a measure of the currents in search areas. Some DMBs now in use are located by radio direction finding (RDF) from the search unit, which must relocate the RDF/DMB for each ocean current estimate. This has two major disadvantages. First, using an aircraft to re-locate a DMB is an extremely expensive way to obtain a very small amount of data. Second, the time spent relocating the DMB is time that must be subtracted from the available search effort. Radio DMBs are being phased out in favor of self-locating datum marker buoys.

3.3.4.2 Self-locating Datum Marker Buoys (SLDMB) utilize satellite-based technology to determine buoy position. SLDMBs provide frequent, high-resolution position information independent of the search unit (search unit does not have to relocate the DMB). The SLDMBs drift with the water mass, providing high quality current information. The use of satellite technology greatly reduces the cost of a position determination in comparison to the cost associated with the RDF/DMB. Section 4.11 provides information and employment guidance for SLDMBs.

(a) SLDMBs improve the efficiency and effectiveness of Coast Guard SAR operations. The goal of the search is to find people so they can be rescued. The use of SLDMBs offers the opportunity of doing the job better, while also saving money.

(b) Search planners should use SLDMBs whenever possible. Planners should specifically direct units to deploy SLDMBs.

(c) Early deployment of several SLDMBs in the area of interest is strongly encouraged. This will provide a more complete picture of the surface currents. SAROPS contains tools that can use the data from multiple SLDMBs to estimate the current vector field over the area of interest. In addition, all data obtained during the operational life of deployed SLDMBs are provided to the National Data Buoy Center and shared with the oceanographic community. This includes, in particular, NOAA and Navy developers who use the data to improve the sea surface current models that produce the products SAROPS uses. In short,

no SLDMB data is ever wasted, even if the survivors are found immediately after SLDMBs have been deployed. The only way to "waste" an SLDMB is to leave it on the shelf until the batteries expire or some other problem develops that will cause the buoy to malfunction upon deployment.

3.3.5 Additional Search Criteria for Search Planning

When creating a search plan there are additional search criteria that should be considered.

3.3.5.1 The following is not a comprehensive list but examples of what to look for and possibly include when planning a search. Often times these possible search areas are missed or forgotten about when planning a search.

(a) Oil platforms;

(b) Buoys;

(c) Shoal water;

(d) Rock outcroppings;

(e) Sandbars;

(f) Reefs;

(g) Uninhabited Islands;

(h) Abandoned Oil wells; and

(i) Old Piers, etc.

Section 3.4
Initial Response, Search Planning, and Search Operations

Effective, efficient prosecution of a SAR incident requires well thought out procedures. Not every incident will develop into a full-blown SAR case, but every case has the potential to greatly expand. Guidance within this section will aid the SAR Watchstander in developing the thought processes necessary for a rapid and thorough reaction upon receiving notification of a potential or actual distress.

3.4.1 Offshore Incidents

As defined in Reference (a), the Commandant has divided the Maritime SAR area into two sections, Atlantic Area and Pacific Area Commands, responsible for efficient coordination among all SAR regions and sectors within their sections. The Area and District RCCs generally have responsibility for offshore incidents. Search planning is done with SAROPS in accordance with the guidance provided above.

3.4.2 Coastal Incidents

3.4.2.1 Initial Response Search Area. The Sector Command Center generally has the responsibility for coastal incidents. When an SRU is dispatched, it should be sent to the position where the search object is expected to be (datum) when the SRU arrives on scene. This includes estimating the object's drift between the time of the incident and the ETA of the SRU on scene if the search object was not reported to be anchored or aground. Often it will be sufficient to mentally estimate the drift based on local knowledge and/or on scene conditions due to the short time spans associated with initial responses near the coast and the high level of activity involved when initiating a response.

(a) When the search object is not located upon arrival on scene, the default initial response for the responding SRU(s) is to conduct a search with an average coverage of 1.0, unless otherwise directed by the SMC.

(b) For an expanding square search (SS), this means the track spacing should equal the sweep width.

(c) For a sector search by a surface craft, this means the search radius should be about twice the sweep width.

(d) For a sector search by aircraft SRUs, the minimum radius should be the distance the aircraft can cover in one minute at search speed, or twice the sweep width, whichever is larger. Since aircraft can often cover the area several times in a short period, they should cover the area repeatedly until coverage of at least 1.0 is reached. For example, if the search speed were 90 knots and the sweep width was 0.1 NM then a single six-sector pattern with a radius of 1.5 NM (distance covered in one minute at 90 knots) would achieve a coverage of about 0.19 in about 9 minutes. Covering the area six times would produce a total average coverage of about 6 x 0.19 = 1.1 in about an hour.

(e) If the reported position of the distressed craft is in shallow water, it could be either anchored or adrift. Orient the search area and the first leg in the direction of drift, that is,

in the same direction as the total drift vector. If success is not achieved quickly, extending the search down the drift line may also be appropriate.

(f) The SMC should initiate a SAROPS case as soon as practicable and its results, if available in time, may be used to guide the initial search response. In any event, if the initial response does not locate the survivors quickly, a more comprehensive search plan will be required and SAROPS will be needed.

3.4.2.2 ***The SRU shall also keep the SMC constantly updated on conditions, findings, and when nearing completion of the initial response search.*** This direction should not preclude a SRU from using an alternate search pattern or area when it is clearly indicated (e.g., narrow waterway or other physical barrier).

3.4.2.3 **First SRU on scene procedures**. Pre-established operations and search procedures for the first SRU on scene are to immediately report the on scene conditions and findings to the SMC. If the object of the SAR incident is not initially located, begin the appropriate search pattern. *Important note:* The objective is to perform an accurate search pattern *relative to the search object*. If the search object is adrift and likely to have a high drift rate (strong winds and/or currents), it is often better for surface SRUs to use more traditional DR navigation techniques without correcting for set and drift than to use modern high-precision navigation systems like GPS to trace a nearly perfect pattern over the bottom. The DR technique automatically compensates for the water current component of the search object's drift, which is especially important when searching for PIWs. For aircraft SRUs, the same effect may be obtained by deploying a smoke float at datum and flying the search pattern relative to that object. Surface SRUs may also find smoke floats to be helpful aids.

(a) For surface SRUs -- usually an expanding square search (SS) is performed. If the search area is confined or there is reason to have a high degree of confidence for the selected datum (i.e., debris found), the surface SRU may use a sector search (VS). For an initial search, use the appropriate track spacing from Table 3-1 when the sweep width is not readily available.

(b) For helicopter SRUs. Helicopters are a suitable platform to perform SS and VS pattern searches. Depending on the proximity to the coast and environmental conditions, an area with a larger radius covered multiple times may be appropriate for a helicopter during the initial search due to a higher search speed. For an initial search, use the appropriate track spacing from Table 3-1 when the sweep width is not readily available.

Table 3-1 Initial Track Spacing

Initial Track Spacing (NM)		
Search Object	Good Conditions wind < 15 kts seas < 3 ft	Poor Conditions Wind ≥ 15 kts seas ≥ 3 ft
PIW	0.1*	0.1*
< 15 ft	0.5	0.2
≥ 15 ft	1.0	0.5
* or > 0.1 depending on SRU's minimum navigational accuracy and maneuvering capability		

3.4.2.4 SMC Action. ***In coastal SAR, the initial response datum shall be quickly established.*** In the interest of saving time and effort when doing drift computations manually, the datum for the initial response may be determined by calculating drift using the object's last known position and the effects of water current and wind without considering leeway divergence (Figure 3-1). Time of datum must take the underway and transit times for the SRU into consideration. When using SAROPS, there is no time or effort penalty for including leeway divergence so it is automatically included when that tool is used.

If the initial response SRU reports arriving on scene without finding the search object, the SMC shall develop a more comprehensive search plan and shall notify appropriate additional resources that they may be needed and may deploy some of them immediately if conditions warrant. Examples of issues to consider include, but are not limited to, the survival prospects of the distressed person(s), remaining daylight hours, remaining endurance of the initial response SRU, etc. In any case, no more than two hours should be allowed to elapse after the initial resource arrives on scene before a more comprehensive search plan is put into effect, which may require deployment of additional resources.

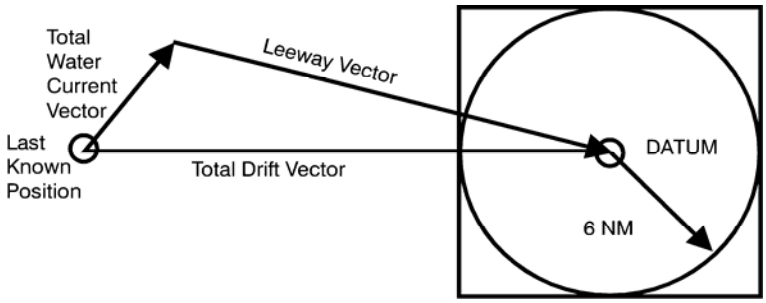

Figure 3-1 Vessel Adrift (Quick Manual Calculation for Initial Response)

(a) Factors to be considered for establishing this initial datum in coastal conditions are primarily tidal, river, coastal, longshore and wind driven currents. ***SMCs shall maintain data on water currents applicable to their local SAR environment.*** The annotated bibliography contained within Appendix K has sources of such information.

(b) Local sources such as marinas, Coast Guard Auxiliarists, harbor masters, sailing and yacht clubs, pilot stations, oceanographic research institutions, state fish and game or park services, local sheriff and marine police, fishermen, marine operations and salvage companies may all contribute to develop a local data base of knowledge.

(c) Other references and sources of information regarding water current are outlined in the National SAR Supplement. Stations and search planners are reminded that one way to determine total water current for estimating drift is by using a DMB.

(d) An extremely important source of local, real-time on scene environmental data is fishermen and other boaters. Timely, on scene environmental data from any source should not be overlooked.

3.4.2.5 Search Area. In the coastal environment, search areas that result from the guidance given above are usually large enough to include most objects if 6 or less hours have elapsed since the distress incident. If more than 6 hours have elapsed, or other conditions indicate (i.e. distress location is best described by an area or a voyage/flight scenario, the object type is uncertain, etc.), SAROPS should be used.

3.4.2.6 Search Patterns. The search patterns listed in Chapter 5 of the *IAMSAR Manual* can be used by any search unit. The National SAR Supplement expands upon the computations and techniques for performing coordinated vessel and aircraft search patterns. The complexity of some patterns may preclude their use by SRUs with limited navigational capability. The Square Pattern (sometimes called Expanding Square) and Sector Pattern are often the patterns used for initial search efforts. The information in the following paragraphs is provided as an aid to using these two patterns. A Course and Leg Identifier tool for these patterns is available and should be carried in SRUs for easy calculation of courses and times for each search pattern leg. This tool may be obtained through the federal supply system under DEPT. of TRANSP., USCG-PLOTTER (6-79) SN 7530-01-GF2-9010.

(a) **Square Single Unit -- Sierra Sierra (SS).**

(1) This pattern is used when there is a high degree of confidence the search object is close to the estimated datum position. The first leg is normally in the direction of the search object's drift. All course changes are 90 degrees to the right. If possible, the datum position should be marked with a suitable floating marker that will be visible from several track spaces away, such as a smoke float. Every effort should be made to keep the floating marker in the center of the pattern. Usually traditional DR navigation methods are used to accomplish this.

(2) The pattern shown in Figure 3-2 has 1 NM track spacing. The length of each leg is indicated. For different track spacing, multiply the distances shown in the pattern by the desired track spacing to find the length of each search leg.

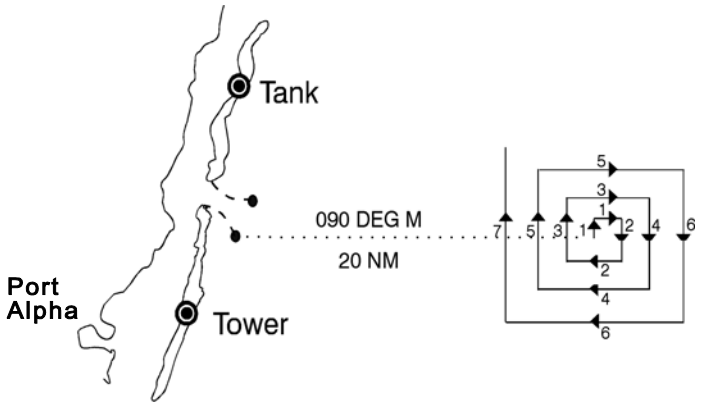

Figure 3-2 Square Pattern: Single Unit

To determine the time required to transit each leg, use Table 3-2, Square Pattern Computations. Enter the Table with the track spacing and SRU speed. Multiply the number from the Table by the length of the search leg shown in Figure 3-2 to get the time required to complete that leg at the given search speed.

Example: Track spacing = 3 NM, speed = 10 kts:

- Find the length of the second southerly leg. Solution: Multiply the length of the second southerly leg of Figure 3-2 (4) by the 3 NM track spacing to get 12 NM.
- Find the time required to complete this search leg. Example: Enter Table 3-2 with a track spacing of 3 NM and a search speed of 10 knots and read the value "18:00" (18 minutes and zero seconds). Multiply this value by 4 (leg factor in Figure 3-2). The result is 72 minutes to complete the leg.
- Coverage is computed as the ratio of sweep width to track spacing (C = W/S) in the usual fashion.
- POD is obtained from the appropriate POD vs. Coverage curve in Figure N-10 of the *IAMSAR Manual, Volume II*.

Table 3-2 Square Pattern Search Computations

Track Spacing	Speed (kts)								
	3	5	8	10	15	20	60	80	90
0.5	10:00	6:00	3:45	3:00	2:00	1:30	0:30	0:225	0:20
1.0	20:00	12:00	7:30	6:00	4:00	3:00	1:00	0:45	0:40
1.5	35:00	18:00	11:15	9:00	6:00	4:30	1:30	1:075	1:00
2.0	40:00	24:00	15:00	12:00	8:00	6:00	2:00	1:30	1:20
2.5	50:00	30:00	18:45	15:00	10:00	7:30	2:30	1:555	1:40
3.0	60:00	36:00	22:30	18:00	12:00	9:00	3:00	2:18	2:00
3.5		42:00	26:15	21:00	14:00	10:30	3:30	2:405	2:20
4.0		48:00	30:00	24:00	16:00	12:00	4:00	3:03	2:40
4.5		54:00	33:45	27:00	18:00	13:30	4:30	3:255	3:00
5.0		60:00	37:30	30:00	20:00	15:00	5:00	3:48	3:20
6.0			45:00	36:00	24:00	18:00	6:00	4:33	4:00
7.0			52:30	42:00	28:00	21:00	7:00	5:18	4:40
8.0			60:00	48:00	32:00	24:00	8:00	6:03	5:20

Note: All times in minutes and seconds
Note: Interpolation may be used in this table

(b) **Sector Search Patterns.** These patterns are best used when the datum is established within close limits, a very high coverage immediately around the datum is desired, and the area to be searched is not extensive. The patterns resemble the spokes of a wheel and cover circular search areas. Datum is located at the center of the wheel and should be marked with a suitable floating marker. By marking datum, the SRU has a navigation check each time the SRU passes through the center of the search area. Note that this means the search area is "drifting" with the floating marker, which is usually desirable. While there are many types of sector search patterns, a six-sector pattern is usually used. It

consists of three equilateral triangles with one corner of each triangle in the center at datum. See Figures 3-3 and 3-4. The search radius is also the length of the crossleg. The track spacing ranges from zero at datum to a maximum equal to the search radius at the end of each search leg. This search pattern can be used in both single and multi- unit searches. Sector searches have a very high Probability of Detection (POD) near datum as a result of the very high coverage there.

(1) **Sector Search Pattern: Single Unit -- Victor Sierra (VS)**, Figure 3-3. When practical, the first leg of the search is normally in the direction of search object drift. All turns in this pattern are 120 degrees to the right. All legs of the search pattern are equal to the chosen radius. Upon completion of the pattern, a second pattern is started with the heading of the new first leg 30 degrees to the right of the final course of the first pattern.

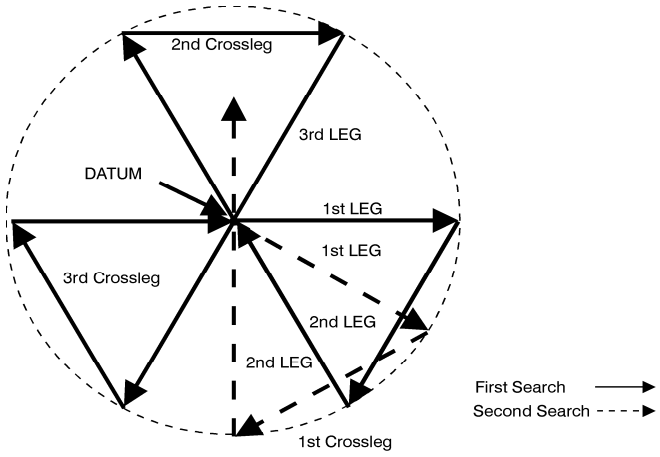

Figure 3-3 Sector Pattern: Single-Unit

(2) **Sector Search Pattern: Two-Units -- Victor Mike (VM).** The VM pattern may be used when two surface SRUs are available, Figure 3-4. As the first SRU begins a Victor Sierra search, the second begins its pattern at datum in a direction of 90 degrees to the left of the first leg of the first SRU. If the SRUs arrive on scene to begin the search at the same time, the second starts at a lower speed than the first. When the first SRU is about one leg ahead of the second, the second accelerates to search speed. The slow start of the second SRU prevents the SRUs from arriving at datum at the same time. When both have completed one VM pattern, the coverage is the same as if a single SRU had completed two VS patterns.

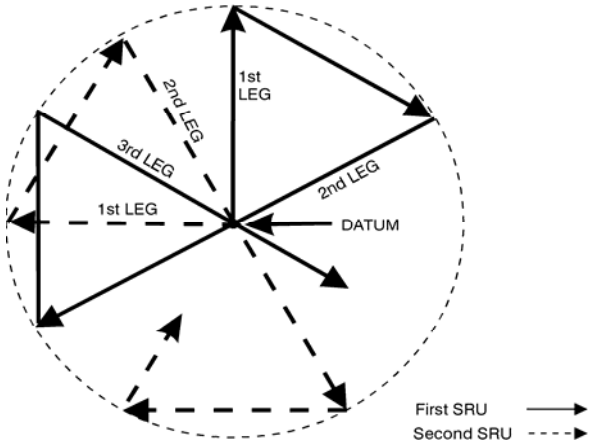

Figure 3-4 Sector Pattern: Two-Unit

(3) The sector search pattern becomes too complicated for more than two SRUs. When more than two SRUs are available, consider using a multi-unit parallel track (PM) search pattern, or dividing the search area into smaller areas and conducting single unit searches. Sector search distance and time calculations are as follows:

a. To determine the distance traveled by each SRU completing a sector search, multiply the radius (R) by nine. (Trackline = 9 x R NM)

b. To determine the Total Time (T) for a search, multiply the time (t) for one leg from Table 3-3 by nine. (T = 9 x t)

c. To determine Total Area (A) covered in a search, square the radius (multiply the radius (R) by itself), and then multiply the resultant by pi (3.14). (A = R x R x 3.14)

d. To determine coverage (C), multiply the total distance SRUs traveled while searching by the sweep width (W) and divide the result by the area (A) covered. (C = (Trackline miles x W)/A)

e. To estimate the average POD over the area covered, use the "Poor search conditions" POD curve from Figure N-10 of the *IAMSAR Manual, Volume II*. (A requirement for "Ideal search conditions" is parallel search legs, which the VS and VM patterns clearly do not have.)

Table 3-3 Sector Pattern Search Computations

Radius	Speed (kts)								
	3	5	8	10	15	20	60	80	90
0.5	10:00	6:00	3:45	3:00	2:00	1:30	0:30	0:225	0:20
1.0	20:00	12:00	7:30	6:00	4:00	3:00	1:00	0:45	0:40
1.5	30:00	18:00	11:15	9:00	6:00	4:30	1:30	1:075	1:00
2.0	40:00	24:00	15:00	12:00	8:00	6:00	2:00	1:30	1:20
2.5	50:00	30:00	18:45	15:00	10:00	7:30	2:30	1:555	1:40
3.0	60:00	36:00	22:30	18:00	12:00	9:00	3:00	2:18	2:00
3.5		42:00	26:15	21:00	14:00	10:30	3:30	2:405	2:20
4.0		48:00	30:00	24:00	16:00	12:00	4:00	3:03	2:40
4.5		54:00	33:45	27:00	18:00	13:30	4:30	3:255	3:00
5.0		60:00	37:30	30:00	20:00	15:00	5:00	3:48	3:20
6.0			45:00	36:00	24:00	18:00	6:00	4:33	4:00
7.0			52:30	42:00	28:00	21:00	7:00	5:18	4:40
8.0			60:00	48:00	32:00	24:00	8:00	6:03	5:20

Note: Time to complete one leg (t) in minutes and seconds
Note: Interpolation may be used with this table

3.4.2.7 Describing Search Areas. Search areas are described through various methods falling within the general categories of Corner Point, Trackline, Center Point, and Grid. Chapter 5 of the *IAMSAR Manual, Volume II*, provides a description of each of these methods. In addition, the specific methods below may be useful.

(a) Center Point-Landmark. The center point, or datum, may be designated by a bearing and distance from a geographic landmark. For example: Datum bears 060 degrees M, 10 NM from "Port Alpha" South Jetty light, major axis 000 degrees M, 6 NM by 6 NM (Figure 3-5).

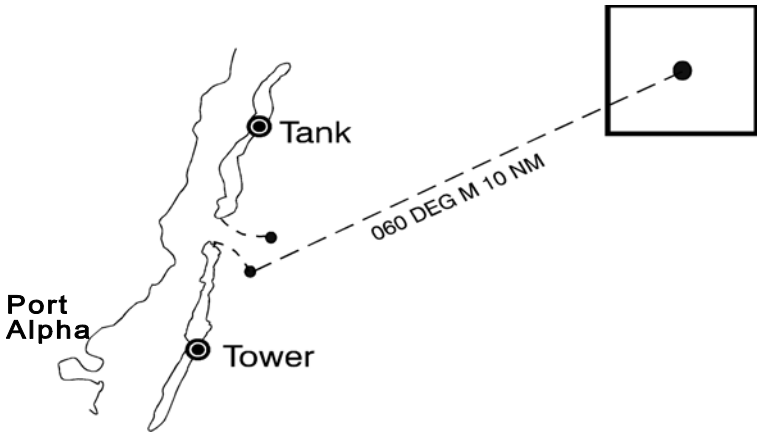

Figure 3-5 Center Point-Landmark

(b) Landmark Boundaries Method. Two or more landmarks are given as boundaries of the search area along a shoreline. For example: Search area from "Port Alpha" South Jetty, south to the Tower to 10 NM offshore (Figure 3-6).

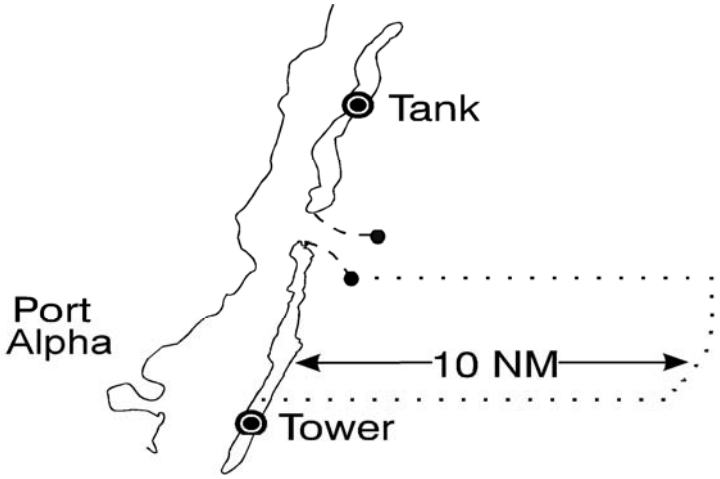

Figure 3-6 Landmark Boundaries Method

3.4.2.8 Track Spacing. Track spacing (S) is the distance between adjacent parallel search legs. The desired track spacing is a function of corrected sweep width, which is a measure of detection capability and will vary with search object type and environmental conditions, and the desired coverage. For a given desired coverage, the more difficult an object is to detect, the closer together the search legs must be.

NOTE: In darkness or extremely low visibility, surface search craft should periodically stop their engines and listen. If it is known or if there is a high probability that the PIW has night detection aids, a search may be conducted with track spacing compatible with the sweep width for the type of detection aid.

(a) Track Spacing by search object type, size and search unit. Detection capability also varies by search unit. The Tables and Graphs in Appendix H show the uncorrected visual sweep widths for search platforms for certain objects and correction factors for weather, fatigue and altitude in the case of aircraft. The most frequent search platforms used by Coast Guard resources for coastal SAR cases are small cutters (WPB), boats (MLB/UTB/UTM), and helicopters (HH-65/HH-60J). It is recommended that Coast Guard units copy and laminate the appropriate tables from Appendix H for each SRU and include them in the SRU pilot or coxswain kit as a quick on scene reference for initial searching while more thorough search planning is being conducted.

(b) Persons in the Water (PIWs). In most cases, a track spacing of 0.1 NM is the lower practical limit for accurate surface navigation, and is recommended for initial coastal surface PIW searches. Search legs for helicopter SRUs should allow at least one minute of level flight. Once on scene, helicopters should search the assigned area repeatedly using patterns of different orientations to achieve a coverage equivalent to using a 0.1 NM track spacing when searching for PIWs. Caution: In some areas, currents with high gradients

(large changes over short distances and or times) rapidly induce a large uncertainty in estimating where the PIW may be. The net result is a larger search area that may be difficult to cover at 0.1 NM track spacing with the available resources. SAROPS can often provide substantial assistance in determining appropriate search patterns, especially since it can model the simultaneous motion of search objects and SRUs when evaluating alternative search plans. These may look considerably different from those generated by traditional "rules of thumb." Search planners should give such recommendations serious consideration and step through them with SAROPS' Time Slider or Animation features to make a careful assessment before rejecting them because they do not fit the traditional mold. Additional guidance and cautions are provided in Appendix H.

3.4.3 Flare Incidents

Federal law requires all vessels 16 feet or greater in length to carry visual distress signals. Vessels 16 feet in length or less are also required to carry visual distress signals suitable for night use between sunset and sunrise. Most vessel operators elect to carry flares in order to fulfill this requirement.

3.4.3.1 The nature of flare distress signaling makes planning and execution of searches difficult due to:

(a) The wide variation of flare types;

(b) Range of possible maximum altitudes;

(c) The skill level and position of the reporting source/observer;

(d) The weather; and several other factors.

3.4.3.2 For that reason, the accuracy of the initial information received from a reporting source and/or observer is most critical. As with all SAR cases, a prompt, thorough and proper response yields the greatest chance of effecting a rescue. Otherwise, the search planner may have no choice but to dispatch SRUs to search a large area to account for long range sighting possibilities. For example, a hand-held flare in a recreational boat seen on the horizon by a beach observer, assuming the observer's eye and the flare are both six feet above the water, will be approximately 5.75 NM away while a parachute flare rising to 1200 feet and seen on the horizon by the same beach observer could be more than 40 NM away. Specific policies regarding response to flare incidents follow. Guidance on evaluating and planning for distress flare incidents is provided in Appendix I. The SAR Tools provided with SAROPS contain a tool for estimating the area containing a flare that has been sighted.

3.4.3.3 Red and orange flares and pyrotechnics ***are recognized as marine and aviation emergency signals and shall be treated as a distress and responded to unless available information indicates otherwise. Unresolved (insufficient information to either close or suspend) red or orange flares require first-light searches.***

(a) Only on rare occasion would a first light search not be required; and only under specific conditions and after a careful evaluation of the circumstances and results of completed search efforts. In all cases (not just flares) the primary driver in close or suspend decisions is the effectiveness of the search; POS.

(b) ***In addition to all the factors considered when making case suspension decisions for any***

type of SAR incident, the flare first light search decision in particular must have:

(1) ***The area in which the flare was sighted is confined***. The area has natural or manmade borders present such as a bay surrounded by land, harbor enclosed by breakwalls, etc.

(2) ***The area was effectively searched***. Search efforts produced a high coverage factor and a subsequent high POS was achieved. First light search efforts would not significantly improve POS.

3.4.3.4 Other flares and pyrotechnics: Searches and follow-up searches for the sources of flares or other pyrotechnics other than red or orange flares will depend on the specifics of the case. These sightings should be carefully investigated to determine the appropriate level of response.

(a) ***The time taken to investigate or seek other correlating factors for other color flares must be tempered with the prevailing environmental conditions and impact on survival***.

(b) A more immediate response may be appropriate in situations where any delay would likely result in harm to the potential persons in distress prior to rescue units arriving on scene.

3.4.3.5 Initial Search Object. When a flare is observed at night, the initial search object should be the distress-signaling device unless other information indicates a specific object, such as the reporting source observing the point of origin (vessel, PIW, etc.).

(a) If search object drift is required, the same provisions for drift for first light searches should be followed.

(b) The provisions of Section 3.4.5, which covers night and reduced visibility searches, should guide subsequent night searches.

(c) When a flare is observed in daylight, the guidance provided for first light search objects should be followed.

3.4.3.6 First Light Search Object. When planning a first light search following a flare sighting in the absence of local information on probable search objects, the planner should use the factors for leeway associated with the object listed in Table H-7 as: power vessel/sport boats/cuddy cabin /modified v-hull. A similar object for sweep width should be chosen (power boat 20 foot) unless local information would justify another object. In SAROPS, the equivalent choice is Vessels/Sport boats/Cuddy cabin with a length of 20 feet.

3.4.3.7 Searching the Initial Flare Cone. When the sighting of a flare occurs in a location where a vessel could have anchored or grounded, the first light search should include the initial flare cone area in addition to the drifted area.

3.4.4 Distress Beacon Incidents / SARSAT (Search and Rescue Satellite-Aided Tracking) Alerts

Distress beacons (EPIRBs, ELTs, and PLBs) are some of the most important tools available to SAR authorities. The various distress beacon systems are covered in Chapter 3 of Reference (a) and Section 2.1.4 of this Addendum.

3.4.4.1 Risk Management Regarding Alert Positions. In some instances, the indicated position for an alert is so significantly distant from available SAR resources that it is impractical to immediately dispatch resources to assist. Similarly, there are situations in which distress alert information is sketchy and the immediate dispatch of SAR resources would jeopardize the

safety of others or leave a relatively large area of responsibility (AOR) without SAR coverage. In these situations, RCCs should spend a reasonable amount of time investigating and evaluating the situation prior to dispatching resources. Additionally, RCCs may attempt to alert alternative resources (e.g., Good Samaritans, Amver participants, other agencies, etc.) that may be in a position to assist.

3.4.4.2 Response Policy. In response to beacon alerts, RCCs should consider all available information such as position information, registration information, and the presence of corroborating information. RCCs should evaluate reports and attempt to correlate them with other indications of distress. Concurrently, they should attempt to obtain additional information on those involved. RCCs should expand their investigations as necessary to aggressively pursue the cause of alert signals and dispatch resources to assist, as circumstances require. Types of beacon alerts and response policy guidance are presented in Table 3-4 below.

(a) Audible beacon alerts don't always indicate distress, but they do indicate that a beacon has been activated. Historically, many of these alerts have been false alerts resulting from hard aircraft landings or caused by crew error during vessel maintenance. SAR response to an audible beacon signal should be similar to the type of response provided for flare sightings. In cases where Coast Guard resources hear the beacon, they normally respond immediately and determine the signal source. Most other audible signal reports come from commercial aircraft and will help determine general beacon location.

Table 3-4 Beacon Alert and Corresponding Emergency Phase

BEACON ALERT	EMERGENCY PHASE
• 406 MHz GEO registered alert, unlocated* alert • 406 MHz GEO unregistered, unlocated alert with digital encoded GPS position ("E" Solution) • 406 MHz LEO "A" solution alert • 406 MHz LEO registered, unlocated alert • 406 MHz LEO unregistered, unlocated alert with digital encoded GPS position ("E" Solution) • 121.5/243 MHz multiple reports of audible alert	**Initially evaluate as Distress**
• **406 MHz LEO "B" solution alert with probabilities > 20% • 121.5/243 MHz First report of audible alert	**Initially evaluate as Alert.** Investigate, reevaluate and respond as facts and circumstances warrant.
• **406 MHz LEO "B" solution alert with probabilities ≤ 20%	**Initially evaluate as Uncertainty.** Investigate, reevaluate and respond as facts and circumstances warrant.
* "Unlocated" in this context means the Cospas-Sarsat did not provide a system doppler determined position; this may be a point of confusion when discussing "E" Solutions (GPS position) and being "unlocated". **All "B" solutions should be coordinated with the "A" solution cognizant RCC in evaluating and/or responding to alert/distress candidate "B" solutions. Always check vessel type/description and homeport/registration POC data against alert position. This practice can help flag correct "B" solutions.	

(b) **406 MHz Beacon Cospas-Sarsat Alerts.** Since 1990, beacon technology has been

moving to a solely dedicated frequency for satellite distress beacons, 406 MHz. On 1 January 2007, 406 MHz EPIRBs became the only type of EPIRB authorized for use in the United States. Use of this frequency will minimize interference problems. In addition, satellite software recognizes and relays only coded 406 MHz beacon signals, minimizing false alerts. Accordingly, response to 406 MHz beacon alerts is immediate, keeping in mind the precepts of risk management. The use of the 406 MHz emergency frequency is not limited to strictly EPIRBs. Both Emergency Locator Transmitters (ELTs) and Personal Locator Beacons (PLBs) use the same frequency. The use of PLBs in the marine environment has become more common as they represent a more cost effective distress tool for recreational boaters. Beacon manufacturers are actively marketing PLBs to the recreational boating public. As an emergency signaling device, an ELT or a PLB functions similarly to a 406 MHz EPIRB; response policy to these beacons is identical.

(1) **First alerts and composite solutions for 406 MHz beacons** indicate a beacon has been activated. SAR response to a 406 MHz beacon alert should approximate response to a MAYDAY. The 406 MHz Cospas-Sarsat system and equipment yield high confidence alerts and positions. However, factors such as satellite pass geometry, atmospheric anomalies, and beacon oscillator stability may degrade the beacon signal and position data. Any alert degradation is usually reflected in the split between A and B solution probabilities on first alert messages.

(2) **Registered but Unlocated 406 MHz Alerts.** Treat registered, but unlocated 406 MHz alerts as distress, exploit all reasonable means to ascertain distress position and assist the party in distress, including issuing a UMIB.

a. Registered, but unlocated 406 MHz alerts signal distress, but contain no position information. ***In order to render assistance we must exploit all reasonable means to ascertain at least a general distress position.*** Armed with a general position or usual operating area and suitable homing capable response assets, we are able to render timely, effective assistance.

b. EPIRB registration points of contact are usually the most promising leads for information, particularly for position, situation and further points of contact. In addition, UMIBs should be used as a means to determine distress position and to maximize resource of opportunity response, unless there are compelling reasons to the contrary. When only general position information is available, suitable aircraft should be launched to direction find on the 406 MHz beacon's signal.

c. For incidents where no position information other than homeport is available, issuing a UMIB in the vessel's homeport area is appropriate.

(3) **Unregistered/Unlocated GPS Protocol Beacons.** Location Protocol Beacons or GPS Protocol Beacons contain a GPS chip that can accurately calculate the position of the beacon and transmit that position as part of the beacon registration information received by the satellite. Since the Cospas-Sarsat system requires multiple passes from low earth orbiting satellites to calculate the beacons position by Doppler shift, this technology provides a more timely method of notifying SAR responders of a beacons position.

a. ***For alerts that contain an encoded GPS position (described in alert messages as***

an "E" solution), responders shall evaluate it as a distress incident regardless of whether the beacon is registered or if a location has been determined by the Cospas-Sarsat system.

b. When a composite position is obtained by Cospas-Sarsat satellite passes, SAR planners should compare the encoded GPS position to the composite solution to verify the location of response.

(4) **50/50 Split Solutions.** 50/50 splits are no different than other A/B solutions and merely indicate that mathematically the beacon could be in either location. Plotting the position and carefully analyzing the beacon decode and registration information will usually allow you to determine the actual location. Also note that 50/50 solutions tend to be less accurate than other solutions.

(5) **Beacon Solutions that contain a garbled beacon ID code.** There are alerts received which contain a garbled beacon ID code. This may be a result of a beacon that has been damaged or is faulty. A garbled beacon ID code does not allow use of the registration database or to decode the beacon ID to determine the type and usage of the beacon. The Cospas-Sarsat system is also an international provider of Ship Security alerts. Thus a garbled beacon code may mask the fact that the beacon is part of the Ship Security Alert System (SSAS). Section 2.11 of this Addendum, discusses the interrelationship between the SSAS system and SAR. Within the U.S. SRR, beacons which are forwarded from the MCC with a garbled beacon ID are dual routed to LANTAREA and the responsible district SRR. ***For these situations, the policy for response in Section 2.11.3 applies and LANTAREA along with the responsible SRR shall make every effort to determine the status of the vessel without contacting the vessel directly. If after attempting to determine the nature of the alert, it is unclear whether the beacon incident is either a SAR case or rather, a vessel security incident, operational commanders shall respond to the incident as a SAR case while using due diligence to ensure that responding resources are aware of the potential threat and must evaluate the situation once on scene.***

(6) **Use of Elementals for Rapid Moving Search Objects or Long Drifts**. When processing 406MHz alert position update messages, the composite solution position may not always be the most accurate position to use for search planning. SARSAT data processing algorithms average several elemental position updates (the raw position data from a single satellite pass) to generate the composite position. In instances where the system has been receiving data for a significant period of time (multiple satellite passes) or in an environment where there is significant total datum drift, using the elemental position (raw data) from each satellite pass will provide a more accurate update to the beacons position. This elemental position date is provided on each update message and can be manually plotted using SARTOOLs. Figure 3-7 shows an example of a rapid moving object and position comparison.

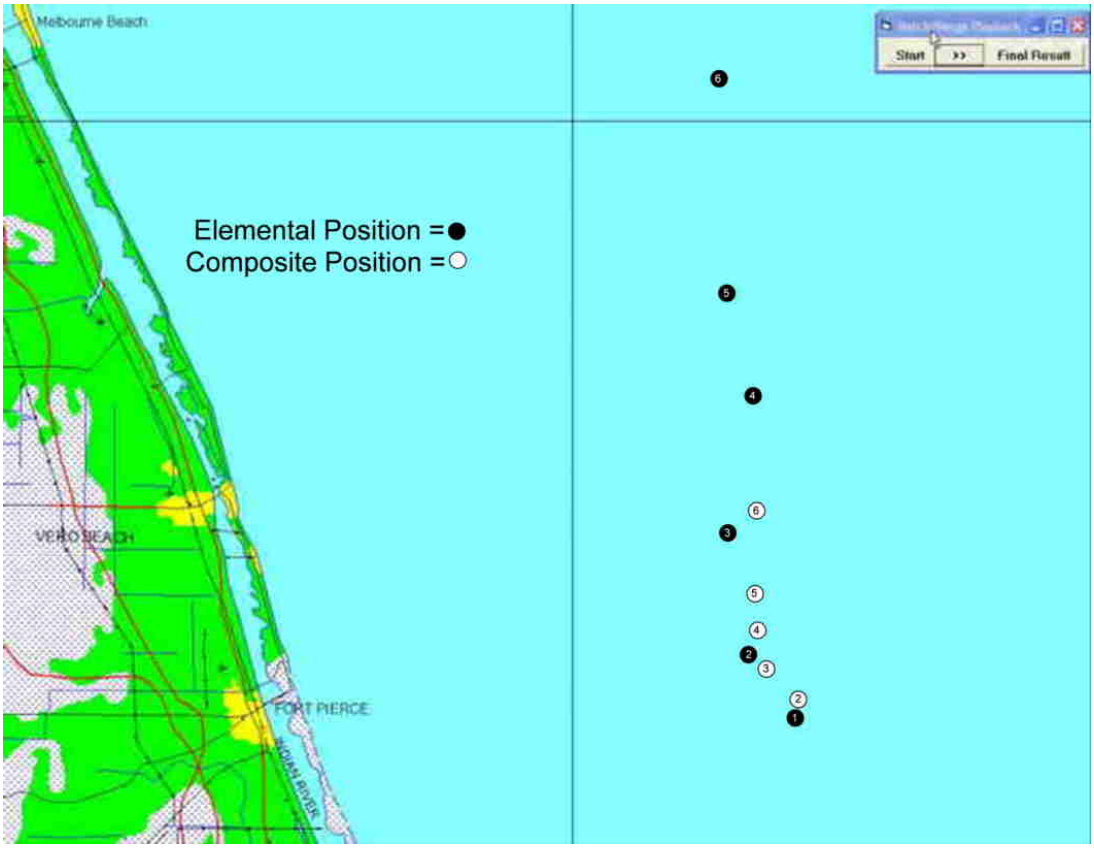

Figure 3-7 Elemental vs. Composite Positions for Rapid Moving Search Objects

(7) **Notification of Country of Registry (NOCR).** Command Centers may occasionally receive messages through the SARSAT system providing "Notification of Country of Registry" or NOCRs. These messages provide notification of the activation of a U.S. registered EPIRB in a location outside of the U.S. SAR Region. In these instances, the beacon activation alert has been forwarded to the appropriate RCC in the nation that has SAR responsibility for the composite position of the beacon, and the United States SAR authorities are being notified as a follow up to the normal SAR response process. Whenever possible, RCCs should attempt to contact the responsible RCC to ensure that SAR response efforts are being taken to assist U.S. citizens in distress.

(c) **121.5/243 MHz Beacon Alerts** .

(1) The operation of EPIRBs on 121.5/243 MHz frequencies became prohibited in the U.S. on 1 January 2007. This prohibition does not apply to Emergency Locating Transmitters (ELTs) normally carried on aircraft or to man overboard devices that operate on 121.5 MHz.

(2) The International Cospas-Sarsat System terminated satellite processing of 121.5/243 MHz distress signals on 1 February 2009. Although RCCs will no longer receive 121.5/243 MHz Cospas-Sarsat Alerts, they will still receive and respond to audible 121.5/243 MHz alerts as indicated in Table 3-4 and outlined in Paragraph (d) below.

(3) Authorized 406 MHz beacons do contain a 121.5 MHz homing signal, which will

continue to be used for direction finding.

(d) **121.5/243 MHz Beacon Audible Alerts.**

(1) The First Audible Report of a 121.5/243 MHz beacon alert corresponds, at a minimum, to the Alert Emergency Phase. RCCs should aggressively attempt to corroborate 121.5/243 MHz audible alerts with any other potential distress information such as overdue or other distress reports.

(2) A Second Audible Report of a 121.5/243 MHz beacon alert corresponds to the Distress Emergency Phase. Though response to 121.5/243 MHz audible reports represent a significant resource commitment with a limited likelihood of actual distress, once additional audible reports have been received, RCCs should make every effort to locate and determine the source of the signal. While it is common to determine that a signal source is emanating from an area where distress is unlikely (such as a marina, anchorage or airfield), it should still be investigated so that the signal can be silenced.

(3) When receiving audible reports of a 121.5/243 MHz beacon alert, RCCs should seek specific details to include the reporting source location, course, speed, altitude, and the strength of the signal heard.

(4) UMIBs/EGCs should normally be made in conjunction with the second audible report and continue to be made for 2 hours after the last signal is received. Consideration should be given to issuing the UMIB/EGC early as this may serve to alert the vessel or other craft with a beacon not in distress (false alert) and prompt them to secure the signal. UMIBs should contain text directing vessels or others who secure 121.5 MHz beacons to notify the Coast Guard.

(e) **Alert Query Reports.** In pursuing amplifying distress information, RCCs may query the USMCC database to see whether or not a particular 406 MHz beacon has been activated, or to check for all beacon activations over a specific time period or in a specific area. RCCs may do so by requesting an Alert Query Report from the USMCC. The USMCC user's manual, Reference (t), has more information on this process and guidelines for interpreting these reports.

(f) **Limitations of the System.** ***As with any tool, search planners must be aware of system limitations***. False alerts (inadvertent activations or hoaxes), non-beacon alerts, and unresolved beacon alerts reduce the efficiency of the C-S system. Operator misuse, equipment malfunctions, improper testing, and hoaxes may downgrade beacon effectiveness. Unresolved alerts are predominantly associated with audible reports of 121.5/243 MHz, which is a congested aviation distress frequency. In addition, many false alerts are caused by non-beacon emissions, harmonics emanating from transmissions on those frequencies, and numerous other signal sources in this frequency band. However, the A solution on a 406 MHz first alert will be the correct position 95% of the time. SAR resources can reasonably be dispatched immediately upon receipt of a 406 MHz first alert. A composite solution will be received, provided the beacon continues to transmit, usually within 60 minutes (average range from 45 - 90 minutes).

3.4.4.3 Policy on Follow-up to False Alerts. Results of beacon activation investigations are essential to improve the system. Units should ensure personnel aggressively pursue and document the cause of all accidental and inadvertent beacon alerts.

(a) Historically, problem areas include bracket failures, improper switch setting and marking, operator error, and water intrusion. False alert information obtained by the Coast Guard should be passed to beacon manufacturers to improve beacon/bracket design or to improve national and international standards. This information should also be well documented in the USMCC's Incident History Database (IHDB) for each case.

(b) In all cases, investigating personnel should educate beacon users on proper registration procedures and beacon usage. Coast Guard personnel should follow guidance in Reference (q) and other appropriate directives in reporting all incidents to the FCC, advising them of the incident and of the actions taken. In the case of first-time offenders, the District Commander in which the vessel is registered should send an administrative letter to the owner expressing concern from a SAR and safety perspective. This letter should remind them of the importance of up-to-date beacon registration (for 406 MHz and other "registered" beacons), and user training and knowledge of EPIRB, ELT, and PLB systems. In the case of repeat offenders, close coordination with the beacon owner and the manufacturer can help identify beacon problems and operator errors.

3.4.4.4 Registration/Follow-up Policy. All Coast Guard and Coast Guard Auxiliary units should make every effort to encourage beacon users to register their beacon. The easiest method for registration is online at www.beaconregistration.noaa.gov. Units should also have spare 406 MHz EPIRB registration cards for users to fill out and mail to the USMCC. A sample registration card is in Appendix J. *It is mandatory for the owner to register the 406 MHz beacon.* In addition, units should relay registration information to the USMCC. Other beacon types are registered in various ways. Units should strongly encourage beacon owners to "register" as soon as possible.

3.4.4.5 Improper Use of EPIRBS as DMBs. EPIRBs are distress beacons. ***As such, search planners shall not normally use them as DMBs.*** While it may seem convenient at times to leave an EPIRB drifting to mark datum during a SAR case, that beacon's signal may prevent another distress beacon from being properly tracked or heard.

(a) SLDMBs are the appropriate tools for marking datum in extended search cases. ***When located, EPIRBs shall be recovered and, whenever necessary and possible, SLDMBs deployed in the same position to mark datum***. Standard radio DMBs work fairly well when no SLDMBs are available.

(b) In situations where the EPIRB is the only means of marking datum, close coordination between the SMC and the USMCC will be required.

3.4.5 Night and Reduced Visibility Searches

Reduced visibility, either due to night or weather, significantly reduces the effectiveness of a search, particularly for objects that are not readily located using radar or other electronic sensors. For planning and conducting searches during night or under otherwise reduced visibility conditions, the following guidance is provided.

3.4.5.1 Timeliness. In addition to SAR incidents occurring at night, it is common for incidents to occur towards the end of the day when mariners are returning (or due to return) from a day on the water. A rapid response with a full search using the remaining daylight may obviate the need for a night search. For searches with reduced visibility in daylight hours, getting search units into the area rapidly will provide some search coverage and facilitate a rapid resumption of full search capability should conditions improve.

3.4.5.2 Continual Searching. ***Searches shall not be stopped solely due to darkness or limited visibility. A number of factors must be considered when planning the level of effort to apply to searching through the night and during periods of reduced visibility, including:***

(a) ***Search units and sensors available*** (discussed in 3.4.5.3).

(b) ***Crew rest and search unit refit***. If time is needed to rest or replace crews, or to refit the search unit, it may be appropriate to do so during the time the unit's search effectiveness would be the lowest; ensuring availability for when search conditions are more favorable. SMCs/OSCs should direct units to return on a rotational basis to achieve both ends of crew rest/unit refit and continued searching when possible.

(c) ***Urgency of response***. The type of SAR incident, prevailing environmental conditions and likely condition and situation of the persons involved dictate the urgency of response. In some situations reduced non-stop search efforts may not greatly impact the survival of the persons involved. However, the survival of the persons involved can be very tightly associated with time, and searching even with low effectiveness in those instances is appropriate. Survival model runs provide information critical to these decisions.

(d) ***Persons in the water. For cases with known persons in the water search efforts shall continue overnight or throughout periods of reduced visibility except where prohibited due to crew fatigue, weather or other safety concerns.*** Absent specific operational (weather, fatigue, etc.) prohibitions, waiting for first light or improved visibility to search for confirmed PIWs is not acceptable.

(e) ***Keeping a search unit in the area during night and reduced visibility is also important for survivor confidence***. Sighting a search unit in the area lets survivors know the search is still on and will bolster their will to live.

3.4.5.3 Search units. The choice of search units, air or surface, depends greatly on safety of operations under the given conditions, the search object, and the sensors available on the various search units.

(a) With reduced visibility it is imperative to employ those search units with the best sensors for the conditions.

(b) The expected duration of reduced visibility conditions will also dictate, to some degree, the choice of search units. If reduced visibility is expected for only a short period, surface units may proceed into the search area immediately while air units, which can arrive more rapidly, may be timed to arrive when conditions are improved. For reduced visibility of longer duration, the decision to use surface and air search units will be more dependent on search object, the sensors available on each search unit, and the effectiveness of those sensors for existing weather conditions.

(c) There may be times when conditions do not permit units to conduct a search such as severe storms. Although not able to effectively search, deploying a surface unit in the search area ready to respond rapidly to a signal or chance sighting should be considered. ***When this occurs, risk management mitigation strategies must be employed.***

3.4.5.4 Search object. The ability to detect an object is based on the sensors available on assigned search units. Depending on the incident and sensors available, the primary search object may be something other than the overall object of the search.

(a) Unaided visual searches at night will not readily detect unlit objects. Even large vessels may be hard to detect if not illuminated and smaller objects such as rafts and persons in the water are nearly impossible to see. Under such conditions the primary search object should be a night signaling device (flare, strobe, light).

(b) Enhanced visual searches using night vision goggles under favorable conditions will permit keeping a PIW or small craft as the primary search object. The night vision goggles can take advantage of less bright light sources and reflective surfaces or materials.

(c) Night searches following a flare should have a primary search object of additional signaling devices. Sensors for other than visual search should also be utilized so that objects of interest within the search area may be investigated.

3.4.5.5 Search tactics. Searchers should utilize all possible means of detecting search objects, visual, electronic, and aural. These tactics are dependent on accurate search planning and coordination. The following should be considered in the planning and conduct of a reduced visibility search:

(a) The SMC should be fully aware of on scene conditions, as searches begin and any changes that occur during the search. Search units should pass to the SMC (or OSC if one is assigned), conditions upon arrival on scene and any changes. This information is critical to assigning appropriate track spacing to achieve the desired search results.

(b) At night all unnecessary lighting on search units should be secured, electronics lighting should be shifted to low light mode to minimize glare on the inside of windows and to preserve night vision.

(c) If the distressed craft or survivors are known to have distress signals, it is important for search units to make their presence known in hopes of getting the survivors to signal. Often the navigation lights alone may not be enough and additional lighting (blue light, search light) may be necessary to get a response. This tactic may be most appropriate for early on searches. The need to limit excess light for night vision considerations may be more appropriate for later searches where there has been ample opportunity for survivors to discharge or use any signaling devices.

(d) If a debris field is discovered, it may be appropriate for search crews to use lights or flares to illuminate the area to enable a better visual search of the concentrated area. This may mean sacrificing night vision for the crew in hopes of spotting PIWs or reflective material that the lights may illuminate.

(e) Ambient light sources should be exploited in a search.

(1) With bright shoreline lights, light colored objects or objects with reflective material in particular may be illuminated enough for the unaided eye to detect, while detection using NVGs will be greatly improved.

(2) A full or near full moon can also provide enough light for the unaided eye to detect an object and greatly improves NVG effectiveness. The reflection of the moon on the water also can be used to search for objects as it "moves" across the surface with the search unit's motion. This is particularly effective in calm conditions with the moon low in the sky.

(3) Large backlit objects may also provide a detectible profile when searching along a well-lit shoreline.

(f) Electronic sensors should be set according to search object as discussed in 3.4.6 below.

(g) On surface search units the engines should be secured (brought to idle if securing not possible) and all other noise minimized in order to call out to and hear calls from survivors. This is a particularly good practice when encountering a debris field or at regular intervals even though no debris is present.

(h) Search units should check buoys and fixed aids in the vicinity. PIWs may swim to something that floats or provides them some form of stability.

3.4.6 Electronic Sensors and Sensor Searches

3.4.6.1 Surface Vessel Radar. Appendix H contains recommended sweep width tables for surface vessel radar. In addition, the following information should be considered when planning searches utilizing surface vessel radars:

(a) The effective search range of radars varies greatly.

(b) Radar range sweep widths for small objects should only be applied in low sea states.

(c) Radar reflective devices significantly improve object detection probability.

(d) The decision of whether or not to utilize the surface vessel radar in a search, especially if it requires dedicating a crewperson who could be used for visual search, should be based on a comparison of the radar sweep width to those for other available sensors. Surface radar searches will generally be preferred when visibility is poor, sea state is low to moderate, and the object is equipped with a radar reflector. Radar sweep widths deteriorate rapidly with the onset of precipitation and/or seas of greater than 4 feet.

(e) Visual scanners should concentrate on the area in the immediate vicinity of the search unit during low visibility radar searches to avoid missing objects that pass through the area of heavy sea return.

3.4.6.2 Forward-Looking Airborne Radars (FLAR). The Coast Guard Research and Development Center has conducted research on Coast Guard fixed wing aircraft to determine detection capabilities of FLARs for SAR operations. From detection data collected under realistic search scenarios estimates of sweep width have been calculated. Appendix H includes the recommended sweep widths for the AN/APS-137, AN/APN-215, AN/APS-127, and RDR-1300.

(a) The AN/APS-137 radar, installed on the Coast Guard's HC-130 fleet, was evaluated for SAR object detection during three field tests conducted by the Coast Guard R&D Center and were reported on in Coast Guard R&D Reports CG-D-14-93, CG-D-07-94, and CG-D-18-94. The AN/APS-137 FLAR is an X-band, air-to-surface Inverse Synthetic Aperture Radar (ISAR) that provides high resolution, small-object detection, weather avoidance, sea surveillance, and Doppler display. The AN/APS-137 system has special selectable features that enhance system performance against weak radar returns. Sweep width recommendations for conducting and planning AN/APS-137 (aircraft) SAR searches are provided in Appendix H.

(b) The RDR-1300 model radar is found on the HH-65 and HH-60J aircraft. This radar is comparable to the APS-215 and the sweep width tables corresponding to the APS-215 are applicable for searches conducted using the RDR-1300 radar.

3.4.6.3 Side-Looking Airborne Radar (SLAR). Side-looking airborne radar is installed on some Coast Guard fixed wing aircraft. The AN/APS-135 model is currently installed on two C-130s at CGAS, Elizabeth City and the AN/APS-131 model is found on the HU-25Bs at CGAS, Cape Cod. The main difference between the models is the length of the antenna.

(a) The AN/APS-131 model SLAR on the HU-25B aircraft is part of the AIREYE system. The AIREYE system was developed primarily as an oil pollution surveillance resource. The system includes infrared/ultraviolet (IR/UV) line scanning device and a KS-87B Aerial Mapping camera. The IR/UV and camera have very limited applicability to SAR. When doing electronic searches the HU-25B aircraft should rely on the AN/APS-131 in combination with its FLAR, the AN/APS-127, and not the IR/UV or mapping camera.

(b) Recommended sweep widths for SLAR on Coast Guard aircraft are shown in Appendix H. Specific findings of the research that are of interest to SAR planners are:

(1) SLAR models tested are capable of detecting 180-foot ships nearly 100% of the time in seas up to at least 6 feet and ranges up to 30 NM.

(2) Objects as small as 16-foot boats with metal equipment (engine, gas tanks, frames, etc.) can be detected better than 90% of the time in seas less than 3 feet and 30% - 50% of the time in seas of 3-6 feet. These objects can be detected in low sea states out to the 30 NM swath width limit.

(3) Four to ten person life rafts can be detected 40% to 70% of the time in seas less than 3 feet, but can be detected less than 15% of the time in seas of 3 to 6 feet.

(c) Presently these SLAR equipped aircraft are the primary iceberg surveillance platforms for the International Ice Patrol.

(d) SLAR has limited use during a search. SLAR is essentially an aerial surveying system. To adequately survey an area, the aircraft must fly level and straight. The SLAR aircraft or other SRUs can then identify the resultant SLAR film's objects.

3.4.6.4 Forward-Looking Infrared System (FLIR). FLIR data was collected in experiments conducted by the Coast Guard Research and Development Center. These studies tested the Northrop Corporation SeaHawk FLIR system, which is not being carried on any Coast Guard aircraft. Chapter 4 of this Addendum lists which Coast Guard aircraft carry FLIR capability.

(a) Extensive testing of FLIR as a SAR search resource with various objects has not been conducted. FLIR has a very narrow field of view. Most units operate with a 7-15 degree field of view. Recommended sweep widths and altitudes for use of FLIR are contained in Appendix H. Sweep widths should not exceed the effective azimuthal coverage of the system in use. Appendix H also contains illustrations of how to estimate a sweep width for a FLIR unit.

3.4.6.5 Night Vision Goggles (NVG). Many SAR incidents occur or become known to the Coast Guard during the afternoon or night. The greatest benefit of NVG is that this sensor enables searchers to conduct effective searches at night, thus search planners will not have to wait until first light the following day to begin effective visual searches. This will increase the probability of survival for those persons in distress. Research showed NVG searches from UTBs are not recommended because the lookouts are prone to seasickness when using NVG, but they are effective from aircraft. Sweep Width Tables for NVG Searches are provided in Appendix H.

3.4.6.6 Photo Reconnaissance Support. Photoreconnaissance is one resource that may have limited benefit in locating those in distress in a large maritime search area. Aircraft equipped for highflying photography include the Coast Guard HU-25B with a KS-87B camera, some U.S. Air Force aircraft, and some aircraft from other agencies. Satellite imagery is also continuously improving although it is not often readily available for the area of interest associated with a particular SAR incident.

(a) High flying reconnaissance aircraft have the capability of covering large areas, up to 20,000 square nautical miles for example, with photographs that are developed and interpreted by technicians. If the sky is cloud free, the cameras cover the area thoroughly; however, specially trained technicians have to search the photographs, not unlike a crewmember on a search aircraft.

(b) The technicians thoroughly review the photographs looking for the search object. This is difficult and time-consuming work. Interpreting technicians have little experience with photographs of open ocean, since they usually look for ground sites using various reference points such as roads, forests, communities, etc. There are no such reference points at sea and this makes the "photograph search" more difficult. Also, they are often unfamiliar with what search objects look like from the air for identification purposes. The successful outcome of a search by these reconnaissance aircraft is solely dependent on the interpreting technician finding the object.

(c) In past SAR cases, the Coast Guard has requested that Air Force aircraft use colored film. These requests were made under the assumption that the search objects will be more easily found due to the color contrast with the surface of the water than by the contrast on black and white film. Some limited testing by the Air Force was done with color film and high altitude aircraft during 1987. These tests were conducted under ideal weather conditions with minimal cloud cover and known objects in fixed positions. It was determined that small, brightly colored objects, such as a one-man yellow life raft could be detected, but dark objects were more difficult to find, and a one-man black life raft failed to be detected at all. Black and white film has not been tested for maritime searches, though it might be most suitable for large craft such as a fishing vessel. Coast Guard HU-25B aircraft equipped with a KS-87B camera will take black and white pictures only.

(d) Planners can assume that it will take at least one day to get the approval and establish the operations plan for the aircraft. After completion of the flight it may be another day for black and white film to be processed and interpreted. If color film is used the process may take longer because of the special processing that has to be done by one of the limited number of resources. Black and white film is normally processed and interpreted at the home base of the Air Force aircraft.

(e) Due to limited testing and low historical success rate, the Air Force, by agreement with the Coast Guard, will provide aircraft for photoreconnaissance support of SAR only if requested by proper authority and under certain conditions. USAF policy regarding use of these aircraft for SAR support was promulgated by Reference (u). The guidelines established by this directive are as follows:

(1) Use of highflying reconnaissance aircraft for all SAR efforts will be on a strict noninterference minimum cost basis. Scheduled operational requirements and priority training will normally not be rescheduled.

(2) The use of U.S. Air Force reconnaissance aircraft shall be based on area coverage, range, weather, type of film requested, mission and training impacts, etc.

(3) "Special interest" situations involving Headquarters USAF or USCG, or Congressional directed SAR support shall be approved on a case-by-case basis at the air staff level. Air Force Headquarters will coordinate such cases with appropriate major commands, Headquarters ACC and Headquarters USCG, as required.

(f) The following procedures apply to Coast Guard commands:

(1) All Coast Guard requests for photoreconnaissance support of SAR are to be made through the operational chain of command to the appropriate Area Command Center. ***If the Area determines that this type of support is appropriate for the case, the Area shall initiate a request to the AFRCC, Tyndall AFB, FL.*** If highflying assets are made available, the SMC will then be authorized direct liaison for passing SAR planning/execution information. The Area is to be kept informed of the status of the mission.

(2) Initial communications should be made by telephone, followed by formal request message. This will give the Area a heads up to an incoming request so time will not be lost waiting for record traffic. ***Commandant (CG-SAR) shall be information addressee on all message communications involving a request for photoreconnaissance support.***

(g) The above guidance is meant to be restrictive due to the expense of using these resources and their limited application to maritime SAR. However, when it is determined that a particular case may benefit by utilizing these resources, search planners should begin the request process as early as possible. These resources take considerable time to arrange and receive the final result of interpretation. An example of a beneficial use may be when the forecast is for bad weather that will preclude normal searching. Photo imagery collected before weather sets in could be studied while other resources are grounded.

3.4.7 Searches for Bodies

Coast Guard units are often requested to search for bodies. However, Coast Guard SAR units are not provided the specific gear (e.g., dragging equipment, etc.) or training to conduct underwater searches. Per United States Coast Guard Regulations 1992, COMDTINST M5000.3 (series), "when it has become definitely established, either by time or circumstances, that persons are dead, the Coast Guard is not required to conduct searches for bodies. If, however, requests are received from responsible agencies, such as local police, military commands, etc., Coast Guard units may participate in body searches provided that these searches do not interfere with the primary duties of the units." The participation normally is confined to a surface search or providing a support platform for other agencies to use their equipment***. Any factors for Suspension consideration shall be based on the surface search efforts, as outlined in Section 3.8.3.***

3.4.8 Aircraft Incidents

Aircraft incidents present a particular challenge to SAR planners. The speed of aircraft and the distance they can travel in a short period of time often makes it difficult to determine the best area to search with the available resources. Once determined, the initial search area is often very large. Various systems associated with aviation safety and tracking can assist in narrowing initial datum and reduce the area to be searched.

3.4.8.1 Emergency Locator Transmitters (ELTs), if operating properly following an aircraft crash or ditching, may provide a position through Cospas-Sarsat or direction finding by SAR assets. However, once in the water aircraft rarely stay afloat and submerged ELTs will cease to provide a signal.

3.4.8.2 Aviation tracking radar systems are present throughout the United States and along the coast for defense and tracking of civil aviation. Several radar-tracking systems are covered in Chapter 2 of Reference (a).

(a) Hill AFB provides technical certification and service for a nationwide array of linked air defense radar's that may provide valuable "near real-time" information to search and rescue planners prosecuting maritime or inland aircraft incidents. The radar information is fully archived for a 90-day period and playback of the event can give a "near real-time" dynamic picture of the subject aircraft's activities leading up to, and at the time of, the incident. Some of this information may be available from the local Air Route Traffic Control Center (ARTCC), which provides greater radar coverage, both in geographic areas and in lower altitudes. It archives "RAW" or "SKIN PAINT" aircraft radar contact information, while the information that is available to ARTCC systems is generally filtered to show only radar information from aircraft that are using a transponder. RCC requests for this information should be made directly to AFRCC: SAR Duty Officer, (800) 851-3051or (850) 283-5955, afrcc.console@tyndall.af.mil.

(b) Shortly after contact, AFRCC should be able to furnish a last known position of the incident aircraft. AFRCC should be given as much information as possible, as the radar system archives ALL air contacts received, and the incident aircraft must be selected from the data available. Within a period of up to a few hours, they will be able to call in an analyst who will review the radar system's archived information, review the available data and update the information. AFRCC will provide an electronic copy of the aircraft incident to the RCC, and assist in its interpretation. This playback will generally fit on a single floppy diskette and/or may be sent electronically. No special hardware or software is required to perform the playback; it will perform well on CGSWIII. The playback may be advanced rapidly, slowed, and paused as required. Each data point of the incident may be "clicked" to show that data point's related information, such as altitude, etc. Copies of the given screen pictures are also easily made using the existing "ALT-PRINT SCREEN" buttons on the PC and copying that information into the program of choice. NO special training is required.

3.4.9 Uncorrelated Distress Broadcasts & Alerts

This section provides the standard Coast Guard procedures to be used in prosecuting uncorrelated distress broadcasts. An uncorrelated distress broadcast is a distress broadcast that does not include position or identification information sufficient to generate a reasonable search area. A distress broadcast may use the internationally recognized distress word "MAYDAY" or any number of words that would indicate a need for assistance including, but not limited to, "help," "emergency," "trouble," "sinking," etc. An uncorrelated distress broadcast could also originate from a radio equipped with DSC where the radio was not interfaced with a GPS and the MMSI was not registered.

3.4.9.1 Thousands of distress broadcasts are received on VHF-FM channel 16 by Coast Guard units each year. Some are made by mariners who may not be able to transmit more than a single broadcast before the condition of the vessel, communications gear or their person renders them unable to transmit additional information. In these cases, we do not have the opportunity to establish direct communications with the caller, and may not be able to ascertain a location or identification. These situations severely hamper the Coast Guard's search planning and rescue coordination efforts. Regrettably, we also receive distress calls from calling parties with the clear intention to mislead or deceive our watchstanders. ***Despite this fact, all distress broadcasts shall be treated as legitimate distress calls unless determined otherwise.***

DSC is a relatively new radio capability that allows the maritime public to transmit a distress by holding down a button located on the radio for 3 seconds. When properly installed and registered in the MMSI database the distress and GPS location would be transmitted via channel 70 to the closest receiving station. The imbedded information contains the owner/operators information. However, if the radio was improperly installed, not integrated with GPS, and was not registered in the MMSI database, this would be considered an uncorrelated distress broadcast. The watchstander's only response option would be to issue a UMIB. A disadvantage to making a distress call via the DSC radio is that the transmitted distress is a data stream that does not allow the system to home in on the signal and create a line of bearing.

3.4.9.2 Watchstanders shall initially treat all distress broadcasts as distress incidents. ***All distress broadcast incidents shall be aggressively pursued and carefully documented.***

(a) ***The SAR mission coordinator (SMC) shall issue an urgent marine information broadcast (UMIB) for all distress situations, unless clearly not warranted.*** This is the minimum response requirement for uncorrelated distress broadcasts – callouts are not sufficient. ***The UMIB shall include text requesting mariners and shore stations that heard the distress broadcast to contact the Coast Guard with their position. The UMIB shall be broadcast for at least one hour at 15-minute intervals.*** Based on information provided as feedback or lack of feedback, the UMIB should be modified to take advantage of this information.

(b) ***When sufficient information exists to establish a reasonable search area, the SMC shall launch appropriate resources to respond to a distress broadcast. In the absence of such information, search planners shall engage in aggressive detective work, using all means at their disposal to narrow down a search area, including:***

(1) *Analysis of high-level site reception.* When an uncorrelated distress broadcast is received on two intersecting high-level sites, a reasonable search area may be developed from the overlapping area (depending on the size of overlapping area) and/or from the direction finding capability that provides a line of bearing from each high-level site. The appropriate degree of error for the direction finding system for each Remote Fixed Facility (RFF) needs to be applied. For search planning purposes, units equipped with the Rescue 21 communications system have +/- 4 degrees of error unless otherwise stated for a particular RFF. In some cases reception on a single high-level site may result in a searchable area due to the form of the land area in relation to high-level site location. Not receiving the distress broadcast on adjacent high-level sites may also allow elimination of overlap areas in initial search efforts. ***Caution must be taken when eliminating areas by using the minimum reception area ascribed by the arc of the non-receiving high-level site (i.e. for height of sending antenna use zero; distance will be determined by radio horizon of the high-level site alone).*** Additionally, the single line of bearing provided by the direction finding would help narrow the search and in most cases result in a reasonable search area. Reference Section 3.4.15 for additional direction finding and range policy.

(2) *Queries to ascertain if other boats or shore based radios heard the call over low-level antennas.* This should be accomplished via the UMIB. Additional queries may be made to refine this information. Knowledge of low-level antenna reception may yield additional reception area arcs, further narrowing the probable location of the distressed caller.

(3) *Replay the transmission.* For all uncorrelated distress broadcast cases, the SMC should immediately review recorded transmissions. The SMC should also immediately review all channel 16 transmissions addressed to the Coast Guard that cannot be readily identified as non-emergent. If possible, several different individuals should listen to the transmission to aid in verifying information. The SMC should be prepared to send an email with the distress transmission attached for the District command center upon request.

(4) *Additional considerations.* If the distress alert has been correlated with or corroborated by other information and the estimated POS for the initial SAROPS search plan is below 75%, consider increasing the on scene endurance, if practicable, or providing

additional SRUs and re-running the SAROPS Planner accordingly.

3.4.9.3 Auto-Distress Communications. In recent years, the Coast Guard has experienced an increase in the number of S-O-S transmissions and electronically synthesized MAYDAY calls on VHF-FM, as well as 2182 kHz distress alarms on MF/HF radio. Experience shows that these types of auto-distress transmissions are often triggered accidentally, creating potentially dangerous safety of life issues for the public and Coast Guard. For uncorrelated auto-distress notifications and alarms, the SMC does not need to launch unless there is a reasonable search area AND there are additional factors that would lead a controller to conclude that a mariner may be in distress. The reasoning is that a voice MAYDAY is an intentional act on the part of the mariner, whereas automatic broadcasts and alarms can be, and often are, triggered inadvertently.

(a) **Auto-Distress Broadcasts.** ***All Morse Code S-O-S transmissions and automated/ synthesized voice MAYDAY broadcasts on Channel 16 VHF-FM are transmitted without position or vessel identification and shall be treated as uncorrelated MAYDAYs. Upon receipt of an S-O-S transmission or automated/synthesized voice MAYDAY broadcast, the SMC shall thoroughly investigate the incident and broadcast a UMIB as a minimum response in accordance with the policy and discussion noted in Paragraph 3.4.9.2.*** Assets need not be immediately launched based solely on a single S-O-S or synthesized MAYDAY broadcast. Launching an asset would be appropriate if a reasonable search area can be determined *and* there are additional factors that may indicate an actual distress situation, i.e. voice MAYDAY, overdue vessels, flare sightings, local conditions or circumstances, etc. Note that this is a slight departure from the policy in 3.4.9.2(b) that requires dispatching assets based on establishing a reasonable search area alone. However, this policy does not preclude Districts from establishing the level of apprehension that will require a launch within their AOR; in fact they are encouraged to do so.

(b) **Auto-Distress Alarms.** Distress calls on 2182 kHz are often preceded by a radiotelephone alarm signal (a tone alternating between 1300 and 2200 Hz four times each second lasting for 30-60 seconds) that alerts listeners to the forthcoming distress message, and are no different from voice radio transmissions of "MAYDAY" or "Coast Guard, Coast Guard come in!"

(c) Auto alarms occur only on 2182 kHz. They are used to alert ship and coast stations that a distress call will follow. You should NOT attempt to answer an auto-alarm with a “unit calling” attempt. You should instead **WAIT AND LISTEN** for the distress call. Testing of an auto alarm is only allowed on 2670 kHz under dummy load conditions. If the Auto Alarm preamble is heard on 2182 kHz for other than the specified amount of time of 30-60 seconds, then it should be classified and treated as an Uncertainty type situation requiring no further action other than to wait and listen for additional details. If there is however the possibility of correlating information to the brief Auto alarm preamble all efforts should be made to correlate the information into a cogent theory of who or what the source of the signal is. If further investigative work is required or SAR Planning efforts are put in motion, then adherence to established case prosecution should be followed.

3.4.9.4 ***The principles of aggressive prosecution and full use of available investigative tools applied for VHF-FM, MF and HF uncorrelated distress broadcasts shall be applied to the receipt of all forms of distress signals (e.g., Cospas-Sarsat, cell phone, flares, etc.).*** The review process

for case suspension or evaluation as a probable hoax should be equally rigorous.

3.4.9.5 Reasonable Search Area. In responding to uncorrelated distress broadcasts the SAR planner is faced with the decision to search or not search under the given circumstances. Search planners should keep in mind that the distress broadcast may be the only opportunity the mariner has to indicate a distress situation. A search for the source of the broadcast, if at all possible, should be the foremost objective. Coast Guard policy is to search if a reasonable search area can be determined. There are however, situations where a reasonable search area cannot be established. The following guidance is provided to assist in determining if an area is reasonable or not. As guidance, it does not relieve SMC's from making a decision, based on all the facts available, for each individual case. What may be a reasonable amount of time to devote to a search in one set of circumstances may not be true under another set of circumstances.

(a) **Search Resource:** SMC should select the resource most appropriate for searching in the general area of the uncorrelated distress signal (i.e. boat in bays/inlets, bounded or near coastal waters may be appropriate while a fixed-wing aircraft may be appropriate for open ocean area.).

(b) **Search Object:** First choice is the search object as included in the distress alert. If the distress alert does not mention a specific object, the second choice is an object selection based on local knowledge of craft, which typically operate in the general area of the alert. If no specific object can be selected based on local knowledge, the final choice is to use a 20-foot powerboat as the initial search object.

(c) **Search Area:** The SMC should determine from the transmission method of distress alert and any information contained in the alert, the probable area. Methods to do this are included in para. 3.4.9.2(b).

(d) **Search Time:** Calculate the time that would be required to complete a search with the chosen search resource, object and area.

(e) **Reasonable Decision:** If the search can be completed with 2 hours of on scene search time by a surface vessel or one hour by aircraft, it is reasonable to conduct the search. This equates to approximately a full sortie of search for an HH-65 being reasonable. Clearly the area that can be searched by other aircraft resources will not equal that of an HH-65, but the same amount of time should be applied, and based on choice of appropriate search resource will determine the area that will be covered in a reasonable search. The 2 hours should not be considered a hard cutoff for when to conduct a search or not, rather an indicator considered with all the other facts of the case in making the decision.

(f) **SAROPS Evaluation:** Evaluation within SAROPS provides an additional tool for making these decisions. If the SAROPS-estimated POS for the best practical search plan for 2 hours of on scene endurance for a boat or one hour for an aircraft (roughly one HH65 sortie equivalent) is at least 50% for an uncorrelated distress alert, the search is "reasonable." This does not mean that a "best search" POS of 49% is automatically "unreasonable." Likewise, this guidance does not preclude the possibility of increasing the on scene endurance beyond the guideline values listed above and planning the search accordingly, especially if such increase is within the SRU's capabilities for total endurance on the search sortie. SMCs are reminded that these guidelines do not relieve them from

making a reasonable decision, based on all the information available, for each individual case.

3.4.9.6 First Light Search Consideration. As with flares, uncorrelated distress broadcasts and alerts that result in the first search effort occurring at night or during reduced visibility, will likely achieve only poor search effectiveness; producing a low POS. ***A first light search shall be conducted unless the SMC has sufficient information to either close or suspend the case.***

3.4.10 False Alerts, Hoaxes and Suspected Hoaxes.

False alerts and hoaxes waste valuable operational resource dollars, frustrate SAR response personnel, and may adversely affect the Coast Guard's ability to respond to real distress calls. The situation is complicated by the fact that it is often very difficult to determine if an incident is a false alert, hoax, or real distress due to sketchy and/or contradictory information. ***This does not change the policy that, until determined otherwise, Coast Guard units shall appropriately respond without delay to any notification of distress, even if suspected to be a false alert or hoax.***

3.4.10.1 The following definitions apply:

(a) **False Alert:** A case where the subject reported to be in distress is confirmed not to be in distress and not to be in need of assistance. In a false alert case, the reporting source either misjudged a situation or inadvertently activated a distress signal or beacon resulting in an erroneous request for help, but did not deliberately act to deceive.

(b) **Hoax:** A case where information is conveyed with the intent to deceive.

3.4.10.2 ***Distress broadcasts suspected to be hoaxes shall be thoroughly evaluated. The conclusion that a particular distress call is a probable hoax must be based on several articulable factors that would lead a reasonable person to conclude that the distress broadcast is false and there is no distress. Until that determination is made, the distress broadcast shall be responded to as a distress. At a minimum the following procedures shall be used in the evaluation to determine a probable hoax distress:***

(a) Locate and replay the suspected hoax distress broadcast on the unit's voice logging recorder and utilize the direction finding capability, if available, to determine the direction of the call. If the line of bearing (LOB) is over land, identify any major waterways that are in the area of the LOB and eliminate the possibility that the distress is originating from that area. Use of sound manipulation software, if available, is encouraged to enhance or clarify the distress call. ***If used, the original and enhanced versions must be documented and saved as per Section 2.10.2.***

(b) Analyze the call and consider all possible correlating SAR scenarios that could be associated with the event.

(c) If still deemed a probable hoax by the watchstander, replay the call to each level up the SAR chain of command. Each level should consider possible SAR scenarios. The final level of review is the District command center prior to final disposition by SMC.

(d) After all levels of review, if the consensus remains that the call is in fact a probable hoax, no other action will be required. If there is no consensus that the broadcast is a probable hoax, or if a recording was not made, the procedures for an uncorrelated distress broadcast

will be followed.

3.4.10.3 Closing or Suspending a False Alert/Hoax Case. When the source of a hoax or false alert has been confirmed, SMC or the SC should close the case. However, when the source of a suspected false alert or hoax remains unknown, the case cannot be closed, but only suspended. Either the SC or SMC (with concurrence from the SC) may do this. In the event Coast Guard resources responded to a suspected hoax at the request of another agency, Coast Guard active involvement should only be withdrawn or reduced when the SC so directs.

3.4.10.4 Investigation/Follow-up. False alerts and hoaxes significantly drain our limited resources. All Coast Guard personnel are encouraged to find innovative ways to reduce the occurrence of these incidents. In the case of hoaxes, aggressive efforts to identify and prosecute offenders are important. ***To that end, all pertinent information relating to a suspected hoax shall be reported as soon as possible to the SC's RCC. The RCC shall evaluate the reports as they are received and determine the need for additional investigation.*** Early contact with their servicing legal office and coordination with CGIS will greatly enhance the likelihood of a successful criminal prosecution.

(a) **Federal Communications Commission (FCC) or other agency involvement.** The FCC can be an invaluable resource in efforts to identify a hoax caller. All RCCs should maintain a close relationship with the nearest FCC office and be familiar with its capabilities to assist in locating the source of a hoax call. ***The original recordings of a suspected hoax call shall be retained for use as part of the distress case evaluation and/or evidence for legal action.*** Legal action can result in penalties as discussed in Chapter 1 of this Addendum.

(b) **Coast Guard Investigative Services (CGIS).** CGIS is also a good source to relay information regarding hoax or suspected hoax cases. Often, they can follow-up with FCC and assist in the investigation.

NOTE: 14 U.S.C. §88 (c) makes it a class D federal felony, punishable by up to 10 years imprisonment and/or a monetary fine, for anyone to knowingly and willfully communicate a false distress message to the Coast Guard or cause the Coast Guard to attempt to save lives and property when no help is needed. The statute also provides for a civil penalty of not more than $5,000 and holds the individual liable for all costs the Coast Guard incurs as a result of the individual's actions.

3.4.10.5 This policy does not attempt to define what is or is not an appropriate response in any given case. ***Operational commanders on a case-by-case basis must make that determination.*** This policy should not be interpreted by the public as creating any duty or obligation of the Coast Guard to respond to false alert or hoax cases, and is intended only for internal agency administration, and is subject to change without notice. If public inquiry is received, the public may be informed of the policy. If informed, the public should be cautioned that it is solely for internal Coast Guard use, and that public reliance on the policy is not intended.

3.4.11 Mass Rescue Operations

Mass Rescue Operations (MROs) are civil SAR services characterized by the need to provide immediate assistance to large numbers of persons in distress, and doing so would exceed the capabilities normally available to SAR authorities. MRO planning, preparations and exercises

are challenging and relatively complex. Effective arrangements for use of national and often international resources beyond those normally used for SAR are essential. MRO preparations require substantial commitments and partnerships among SAR authorities, regulatory authorities, transportation companies, military, commercial assistance and others.

MROs often need to be carried out and coordinated within a broader emergency response context that may involve hazards mitigation, damage control and salvage operations, pollution control, complex traffic management, large-scale logistics, medical and coroner functions, accident-incident investigation, and intense public and political attention, etc. Efforts often start immediately at an intense level and may need to be sustained for days or weeks.

The Coast Guard, as appropriate, should coordinate MRO plans with companies that operate aircraft and ships designed to carry large numbers of persons. Companies such as cruise ship or ferry operators should share in preparations to minimize the chances that MROs will be needed, and to ensure success if they are.

Planning for a contingency response to a MRO incident must be done before the fact in order to identify and engage resources and activities not normally used or called upon during normal Coast Guard operations. This may often include resources located hundreds of miles from the unit's area of responsibility to include inland and out-of-state assets. ***Therefore, each command with persons who may serve as SMC shall complete the forms provided in annexes two through seven in Appendix G (or locally reproduced versions; and updated yearly) in anticipation of a mass rescue event to document potential suppliers of air and surface assets, to document potential staging areas for resources and survivors, and to identify areas of risk where point of contact information is essential to a successful response.***

What the media reports may matter more than what SAR services do for shaping of public opinion about MROs. There should be no unwarranted delays in providing information to the media. ***Information must be readily available, and freely exchanged among emergency service providers, shipping, airline or other primary companies involved***. Since opportunities to handle actual incidents involving mass rescues are rare and challenging, exercising MRO plans is particularly important.

3.4.11.1 Scenarios that could lead to an MRO include:

(a) Hurricanes;

(b) Heavy flooding;

(c) Tornados;

(d) Earthquakes;

(e) Avalanches;

(f) Weapons of mass destruction incident;

(g) Hazardous material incidents; and

(h) Passenger ship or large airliner disasters.

3.4.11.2 An MRO focuses on the lifesaving aspects (rescue phase) of an incident response.

(a) The National SAR Plan (NSP) and the National Response Framework (NRF) provide basic

guidance for immediate multi-agency MRO response. However, response to an MRO under the NRF is in addition to the SAR response, not in lieu of it. More detailed information and interagency guidance on this topic will be developed in the U.S. National Search and Rescue Supplement (NSS). The International Maritime Organization has incorporated MRO input to the IAMSAR Manual (See Radiocommunications and Search and Rescue Circular 31, Guidance for Mass Rescue Operations).

(b) Whenever a situation may lead to an MRO and require a surge in response resources, the District or Area RCC, as determined by consultation, should normally handle SAR mission coordination. The SMC may be shifted to or from another RCC (e.g., the Area or Air Force Rescue Coordination Center (AFRCC)) as appropriate, based on either geographic responsibilities or who is in the best position to coordinate the response.

(c) When a Coast Guard RCC is responsible for response, it should immediately notify applicable federal, state or local resources in the area for assistance. DOD Directive 3025.1, *Military Support to Civil Authorities,* provides guidance to local military commanders for DOD response authority and procedures. ***The Coast Guard RCC shall also immediately contact the Coast Guard National Command Center and, if the RCC is at the District level, the Area command, with the available information on the incident.*** Faxing the initial SAR check sheet, Mass Rescue Operation Supplemental check sheet, and other relevant documentation should follow up the initial call. Timely initial notification is critical; the report should not be delayed simply to gather additional information. The Command Center Duty Officer will initiate a conference call between USCG (Commandant (CG-SAR)), DOD's Director of Military Support (DOMS), U.S. Joint Forces Command, the Federal Emergency Management Agency (FEMA), the National Guard Bureau and the Air Force Rescue Coordination Center (AFRCC). The purpose of this conference call is to consider the need for immediate response, initiate an immediate response by the appropriate parties, and/or expedite the Federal disaster declaration process.

(d) For overall coordination of lifesaving and other missions, an incident involving an MRO will often warrant designating an Incident Commander (IC) within or outside of the Coast Guard. In this case, until the rescue efforts are terminated or suspended, the RCC-designated SMC working under the organizational structure of the ICS should normally coordinate the MRO portion of the response.

(e) Coordination of SAR functions with other functions is usually achieved by assigning a representative of the SAR agency or of the SMC to the Operations Section of the ICS organization. This allows SAR services to be integrated into ICS and overall operations while still being able to function with relative independence in accordance with normal SAR procedures. ***ICS has an overall incident focus, while SAR services must remain focused on lifesaving.*** Except when functions other than SAR are relatively insignificant to the incident response, the IC should normally be someone other than the SMC. The priority mission will always be lifesaving, and the SMC should normally remain unencumbered by additional non-SAR duties. In some cases involving MROs, it may be better to locate the SMC near the incident site rather than at the RCC.

3.4.11.3 SAR Plan onboard Passenger Vessels. The International Convention for the Safety of Life At Sea (SOLAS) requires certain passenger ships to have onboard a plan for cooperation with

the SAR services in event of an emergency. The plan is sometimes referred to as a "SAR Plan" and is developed in cooperation among the ship, its company and the SAR service (U.S. Coast Guard for the U.S.). ***Also, the plan must include provisions for periodic exercises to test its effectiveness.*** Passenger ships falling under this SOLAS requirement are typically passenger ships and ferries on international voyages.

(a) To meet this SOLAS requirement, Commandant (CG-SAR), in conjunction with cruise industry input, developed the "*Search and Rescue Information Form*" (Figure 3-8) based on guidelines developed by IMO. The intent was to have the essential information needed to make an initial SAR response while maximizing access to the more detailed information available elsewhere (e.g., ship engineering plans). The "Search and Rescue Information Form**"** serves as the SAR Plan for a cruise ship and will be incorporated into the Coast Guard's vessel inspection process for carriage of the plan by cruise ships and ferries under SOLAS. The form serves as a template but additional information may be included at the company's discretion. Other countries may require more extensive information as provided for in the IMO guidelines. Cruise ship companies will provide the completed form, and updated versions as needed, to Commandant (CG-SAR) for forwarding to all the RCCs. The RCC will distribute within its district, as deemed necessary. In turn, Commandant (CG-SAR) will provide any changes to the general Coast Guard information to a central point in the cruise industry for further distribution.

(b) SAR exercises will include passenger vessels. RCC and port-level contingency preparedness planning will incorporate the need for a passenger vessel SAR Plan into their exercise planning and their efforts with other emergency responders for SAR exercises.

SEARCH AND RESCUE INFORMATION FORM

Ship's Name:
Company's Name/Address:
Ship Information:
Basic Details of Ship:
MMSI:
Call Sign:
Country of Registry:
Type of Ship:
Classification Society:
Gross Tonnage:
Length Overall (in meters):
Maximum Draft (in meters):
Service Speed:
Maximum Number of Persons allowed onboard:
Number of Crew normally carried:
Communications:
EPIRBs:
HF/MF Capabilities:
Inmarsat Capabilities:
SATCOM Numbers:
VHF capabilities:
Non-GMDSS communications capabilities:
Lifesaving Equipment and capacities of each:
Lifeboats:
Rescue Boats:
Tenders:
Life rafts:
Contact List:
24-hour emergency contacts in order of precedence:
Name position phone number (As detailed as necessary, but should be multiple contacts)
Further Company Points of Contact: (Company public relations officer is recommended.)

Figure 3-8 Search and Rescue Information Form for SOLAS Requirement

3.4.12 Search Action Plans (SAP)

3.4.12.1 SAP Requirement. ***A SAP is required for all search efforts beyond initial response (immediate response to a distress call and formal search planning is not yet completed) and in all cases where two or more search facilities are conducting searches.*** SAPs are recommended for initial response when time permits. ***Where time does not permit and multiple resources are responding SMCs shall ensure that de-confliction is in place; this is particularly important for multiple aircraft. Complete SAPs shall be provided to all participating search facilities. Similarly, any changes to an existing SAP shall be provided***

to all participating search facilities. Every search facility on scene needs to be fully aware of all the other facilities' planned activities for reasons of safety and on scene coordination.

3.4.12.2 Standard SAP Format. A standard SAP allows the reader to quickly find critical information by knowing that it will always be in a certain place and to identify vital information that is missing. Equally as important, the drafter of the SAP only needs to learn the format once, since it is standardized throughout the Coast Guard. The standard SAP format is provided in Appendix C. Benefits of this standardized format include:

(a) time saved in preparing the message;

(b) fewer calls looking for missing information;

(c) time saved finding information critical to executing the mission.

3.4.12.3 Transmitting SAPs. The primary means of transmitting a SAP is record message traffic. Situations and communications availability for participating search facilities may dictate use of an alternative means for transmitting the SAP to ensure timely receipt. ***Search facility units must receive the SAP sufficiently in advance of the commence search time to conduct mission planning, facility preparation (fueling, engine warm-ups, etc.), and transit to arrive at CSP.*** Methods such as facsimile and email are acceptable. Use of an alternative transmission method still requires the full SAP content to be sent. SAPs transmitted by voice are discouraged as mix-up of planning details may occur. A SAP should only be passed by voice if no other means is available; hard copy should follow as soon as practical.

3.4.12.4 Passing Search Patterns to SRUs. In addition to including search pattern descriptors within the SAP, it is often necessary to pass the specific patterns via radio to underway SRUs. Standard Search Pattern Over the Radio Templates for Coast Guard resources are provided in Appendix C.

3.4.13 Automatic Identification System (AIS)

Automatic Identification System (AIS) is a mobile digital radio broadcast by a ship of its safety of navigation information. Though not designed specifically as a SAR tool, AIS can be useful in that role. AIS is mandated for carriage on a variety of ships on international voyages as well as certain U.S. domestic vessels. Many ships now carry AIS and this number will greatly expand as the requirement is phased-in. Many U. S. Coast Guard Cutters and some aircraft will have AIS capabilities; SMCs should consider this in planning search and rescue operations.

The U.S. is establishing nationwide AIS as an element of maritime domain awareness (MDA) to identify vessels approaching or near the coastline, within U.S. ports and inland regions. Present capability for terrestrial-based AIS, including placement at sea on NOAA data buoys, is limited but it is expected to grow quickly in the ports and then expand for the coastal waters. Studies are also underway to determine the feasibility of satellite-based detection of AIS transmissions. Currently, Coast Guard Vessel Traffic Service Centers have AIS receive and transmit capability, and all Sector Command Centers are to be outfitted with this AIS capability.

The AIS equipment capability to send text safety messages is primarily intended for exchange of navigation-related information between vessels and shore stations. Though AIS is not a distress alerting system, the AIS text message could be incorrectly used to broadcast a distress

alert. An AIS text message is not the recommended or preferred method of distress communications, but persons in distress may use any means available to attract attention, make their positions known, and obtain help.

AIS equipment has an alarm, visual and audible, which will be activated upon receipt of an AIS text message regardless of the nature of the text message or its urgency. ***If a Coast Guard command center, vessel or aircraft receives an AIS text message it shall, if able, immediately determine the nature of the message and take action accordingly. If the AIS text message is a distress alert then it shall be assumed to be a distress incident and will be classified in the distress emergency phase.*** Since the AIS broadcast is line-of-sight and provides the vessel's name and position, attempt to establish VHF-FM communications with the vessel, if that is not successful then replying back with an AIS text message might be feasible.

Search planners can access live AIS graphical information from ships off the US coast. The nine digit AIS identity (MMSI) is identical to the ship's nine-digit identity used on its DSC equipped VHF or HF radio and therefore can be used as a means for contacting the vessel such as by Rescue 21 DSC or CAMS HF DSC. The Coast Guard Operations System Center (OSC) maintains an archive of received AIS data, which makes it possible to determine ship location and movement at any specified past time period.

3.4.13.1 AIS is a line-of-sight VHF-FM radio data transmission designed to:

(a) Provide automatically to appropriately equipped shore stations, other ships and aircraft, information including the ship's identity, type, position, course, speed, navigational status, text messages and other safety-related information;

(b) Receive automatically such information from similarly fitted ships;

(c) Monitor and track ships; and,

(d) Exchange data with shore-based facilities.

3.4.13.2 AIS is not a distress alerting system but it does provide benefits for SAR such as:

(a) Locate and identify the distressed vessel;

(b) Identify vessels near the distress location or other vessels around the SAR facility;

(c) Identify vessels and aircraft involved in SAR;

(d) Communicate between vessels, CG vessels, CG aircraft and CG command centers;

(e) Vector potential assisting vessels to the scene;

(f) Serve as a means to crosscheck other reported information (radar, visual sighting, etc.);

(g) If carried on board the SAR response craft, serve as a means to track and monitor its safety;

(h) Depending on the shoreside data network, provide local or regional electronic display of ongoing SAR operations.

3.4.14 Vessel Monitoring System (VMS) Use for SAR

The Vessel Monitoring System (VMS) is a satellite-based tracking system which provides various data, including the vessel's name and position. Some VMS units are also capable of

sending and receiving message communications between the vessel and shore. The National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) is the lead federal agency and requires certain commercial fishing vessels to carry VMS. Though VMS was established for fisheries management and enforcement, NOAA allows use of VMS position information for SAR operations.

NOAA maintains a nationwide VMS (N-VMS) network which is linked to the Coast Guard's common operational picture. Various local procedures have been developed within the Coast Guard for command centers to gain access to this information. VMS data is confidential information as defined by the confidentiality provisions of the Magnuson-Stevens Fisheries Conservation and Management Act and NOAA maintains a control system to prohibit unauthorized use or disclosure of VMS data. While SAR operations and fisheries enforcement may use VMS data, other non-fisheries enforcement purposes have permission for limited use. Limited additional discussion is provided in Reference (o), chapter 7 and appendix E.

VMS is another tool to assist the SAR controller in the prosecution of a case. VMS provides position data that may correlate with distress positions provided by other distress alerting systems such as lines of bearing from Rescue 21. When used in conjunction with other SAR tools a better search area may be developed.

3.4.15 Determining position using Direction Finding (DF) and Range calculations.

Positional information determined via DF shall be treated as any other positional information available in a SAR case. Direction Finding (DF) is a tool used to assist in identifying a possible position of the distress. Lines of Bearing (LOB) and any resulting position information may be used to establish, confirm, or refine the reported position of a distress.

For Rescue 21 only:

(a) The system specification requires that the square root of the average bearing error (called the "Root Mean Square" or "RMS" error) be within ± 2 degrees when computed from a statistically significant number of readings for which the actual bearings are known. For a normal distribution of errors (the familiar "bell curve" from statistics), this actually represents one standard deviation, which means 68% of the system displayed LOBs are expected to fall within ± 2 degrees of the actual LOB. More than 95% of the actual LOB values should be within two standard deviations (± 4 degrees). ***Therefore, for Coast Guard SAR response and search planning purposes, ± 4 degrees shall be used as the LOB error unless documented testing or experience have shown otherwise for a particular RFF.***

(b) The direction finding antenna is a separate unit located above the communications antenna and its receiver has a separate sensitivity adjustment which may result in LOBs with no audio signal. Normally, lines of bearing without an audio signal do not require investigation. However, if the DF is tuned to monitor 121.5 MHz (see Paragraph (c) below) and an LOB results from a 121.5 MHz transmission, the source of the signal should be investigated and a search may be required. The DF can also be tuned to VHF channel 70 (156.525 MHz) as a tool to locate a DSC caller with no GPS position by providing a possible LOB. Section 3.4.4 of Reference (a) provides guidance for distress beacon incidents.

(c) ***For units equipped with Rescue 21, the secondary DF shall be tuned to VHF channel 70 (156.525MHz) per Chapter 11 of Reference (p).*** If the SAR watchstander receives a report of an alert on 121.5 MHz, or 243 MHz, they may shift the secondary DF. This system capability is provided to assist the watchstander with a search if the Coast Guard determines through other sources that an alert on these frequencies is in progress.

3.4.15.1 Estimating Maximum Reception Distances. ***If a single LOB is the only available position information for a distress case, the maximum reception distance of the distress call from the Remote Fixed Facility (RFF) must be determined.*** The actual effective range of each RFF is dependent on transmission strength and the RFF audio antenna height among other factors. The best information available regarding maximum possible range will be used in analysis for possible positions of a distress call. In the absence of other information, the information below will be used to determine the maximum reception distance. All Sector personnel who deal with direction finding should be familiar with the information, procedures and equations needed to estimate the theoretical maximum detection ranges from their RFFs, as described below.

(a) **Determining the RFF Audio Antenna Heights.** The actual height needed for computing maximum reception range for a coastal station is the height of the audio antenna above mean sea-level. For the Great Lakes, inland rivers or other areas it is the average height above the bodies of water in the area from which a distress call might reasonably come. The following considerations need to be made when determining the appropriate antenna height for use in distance computations:

(1) The tower's maximum height may be provided by the vendor, but the RFF audio antenna may be several feet below the top of the tower.

(2) The actual height above ground level for each RFF audio antenna may be provided by the vendor or owner of the tower but if the RFF is part of R21 the actual height above ground level will be provided by the vendor. It is important to ensure the height of the RFF audio antenna is used in distance calculations, not the height of the tower on which it is mounted.

(3) The height of the RFF audio antenna above mean sea level is found by adding the height of that antenna above ground level to the height of the tower's base above mean sea level. The height of the RFF audio antenna above an inland body of water is found by computing the antenna height above mean sea level and then subtracting the height of the surface of the body of water above mean sea level. When calculating the maximum reception range for a RFF, make sure that the correct height above mean sea-level or inland body of water is used.

(4) If a search for a 121.5/243 MHz beacon is conducted with the R21 system, then the height of the DF antenna will be used in the calculations for determining the maximum reception range for the RFF.

(b) **Estimating Search Object Antenna Heights.** The first choice is to use the probable antenna height for the distressed craft as included in the distress broadcast. For example, a sailing vessel may have an antenna mounted on the top of its mast, a commercial fishing vessel may have an antenna mounted on the top of the pilot house, etc. If the actual height is not known, then an estimate of antenna height based on type of craft should be used. If the distress alert does not mention a specific type of craft, the second choice is an antenna

height for an object selection based on local knowledge of craft that typically operate in the general area of the alert. If no specific object can be selected based on local knowledge, the final choice is to use a default antenna height of 30-feet. This provides a reasonably safe estimate for the types of vessels that most often transmit VHF-FM distress calls in waters within range of Coast Guard RFFs.

(c) **Computing Theoretical Maximum Reception Ranges.** The maximum range between sending and receiving antennas is estimated using the sum of the horizon (line of "sight" for VHF-FM) distances for each of the two antennas.

(1) The horizon distance for each antenna is estimated using the following equation:

$$d = 1.23 \times \sqrt{h}$$

Where ***h*** is the antenna height above the water (e.g., mean sea level) in feet, and

d is the VHF-FM horizon distance in Nautical Miles

The total *distance* between the two antennas is therefore:

$$d_{total} = d_{sending} + d_{receiving}$$

Example: A RFF audio antenna near the ocean is 400 feet above mean sea level and the distressed craft's antenna is estimated to be 30 feet above the water. The square root of 400 is 20; when multiplied by 1.23 the resulting horizon distance is 24.6 NM. The square root of 30 is 5.48; when multiplied by 1.23 the computed horizon distance is 6.7 NM. Adding the two together and rounding up to the nearest whole nautical mile, the estimated maximum range from the receiving RFF to the distressed craft would be 32 NM.

(2) Once the calculations are completed, each SCC should develop a table of base ranges for each RFF within that region. For example, the horizon range for each RFF would remain constant. Adding the horizon range of a distressed craft antenna that is 6-feet, 10-feet, 15-feet, etc. above the water would create a quick reference for watchstanders to use when the height of the transmitting antenna can be determined.

(3) The formula the Coast Guard uses for RFF range is for radio line of sight. The distances calculated will not correspond exactly with those produced by table H-41; the distances produced by this source are based on the visual line of sight formula which uses a constant of 1.17 instead of 1.23. Values from this visual line of sight sources may be multiplied by 1.05 to find the radio line of sight. The range and bearing tool provided with SAROPS will compute either visual or radio line of sight distances based on observer (RFF antenna) height and object (transmitting antenna) height. Ensure that the correct options (Radio) and (Great Circle) are selected when computing radio reception ranges.

3.4.15.2 Uncorrelated Distress Broadcasts & Alerts. ***For uncorrelated distress broadcasts the provisions of Section 3.4.9 shall be followed and in particular the direction given in Section 3.4.9.5 in regards to reasonable search area.*** Methods for determining the search area to be

considered for both correlated and uncorrelated distress alerts are described in the following paragraphs.

3.4.15.3 Search Planning. There may be insufficient information available to determine the position of a distress transmission within close limits. It is also prudent to have a search plan available for situations where the SRU arrives on scene but cannot immediately locate the distressed craft or persons. The following paragraphs provide guidance on how to plan an initial search, based on the type and amount of information available for estimating the position of the distress call. Guidance is provided below for both manual search planning and for planning searches using SAROPS/SAR Tools. ***SAROPS/SAR Tools shall be used whenever practicable***. The manual techniques are provided only as a backup in case SAROPS/SAR Tools is unavailable.

(a) **Distress Alerts with no LOB.** If a distress alert is received but a LOB cannot be accurately determined, it will be necessary to estimate the general location based on an estimate of the maximum range of the distressed craft from the receiving RFF antenna(s). Once the distance from a receiving RFF to the distressed craft has been computed, an arc of that radius, centered on the RFF position, may be drawn. Generally, the area defined by the arc and the shoreline adjacent to the intended coverage area is the potential search area when only one RFF receives the signal. However, if there are other bodies of water within the computed radius (i.e. inshore bays, rivers, etc.), the possibility of the distressed craft being in one of those locations should be considered.

(1) If it can be confirmed that the distress alert was received on more than one RFF, the maximum range to the distressed craft from each RFF should be computed and appropriate arcs should be plotted. Either SAR Tools or paper charts and compasses may be used to plot the arcs. The overlap area common to all of the plotted arcs should contain the distressed craft. A rectangle enclosing this overlap area should be plotted and searched with coverage of not less than 1.0. If the SRU cannot arrive on scene before drift becomes a significant factor (i.e. when the combination of drift factors would move the search object outside the area effectively searched), the search should be planned using an "Area" scenario in SAROPS.

(2) If the search object type cannot be otherwise determined, use the default type (20-foot power boat) for estimating sweep width and coverage factor. Choose one or more appropriate objects of this size for use in estimating leeway.

(3) **Manual Computations:**

a. **Compute Maximum Reception Distance:** Use the procedure for computing d_{total} given in Section 3.4.15.1(c) (1) above and use this as the radius of the arc centered on the RFF location. Repeat for each RFF for which reception of the distress alert can be confirmed.

b. **Plot Area:** For each RFF that received the distress alert, draw an arc or circle of the computed radius on an appropriate chart. Note the possible regions where the distressed craft might be. These form the initial search area(s).

c. **Elimination of Regions:** Generally speaking, land areas may be eliminated, although it may be appropriate to consider inland lakes within the maximum

reception distance and work with local authorities as appropriate. ***When the alert was received by multiple RFFs, only the area where all intersect must be considered, although an additional buffer around it may be appropriate***. The fact that the distress alert was ***not*** heard on adjacent RFFs may be used, with caution, to eliminate some regions. In this case, arcs representing the **distance of the horizon** (i.e., transmitter antenna height of zero above the water) from adjacent RFFs should be used rather than the assumed transmitter antenna height used to estimate maximum distance from the receiving RFF. In addition, an aggressive investigative effort and careful analysis of all available data should be pursued to further define the area where the distressed craft could have been at the time of the alert.

(4) **SAROPS/SAR Tools (Preferred Method):** (Note: It is usually easier to do steps 1 and 2 below for each RFF in turn, rather than do step 1 for all RFFs followed by step 2 for all RFFs.)

a. **Compute Maximum Reception Distance:** Use the New Range/Bearing tool to compute the maximum reception distance from a receiving RFF. It is accessed via the button on the tool bar or via the menu "Edit – Quick Overlays – New – Range/Bearing Lines." Data entries are as follows:

1. **Mode:** Direction/Range.
2. **Connect Type:** Great Circle.
3. **Start Position:** Enter the latitude/longitude of the RFF or use the selection tool.
4. **Bearing:** Input bearing of R21 LOB.
5. **Bearing Error:** For R21 use 4 DEG, unless otherwise stated for a particular RFF or region.
6. **Observer Height:** Enter height of RFF audio antenna.
7. **Object Height:** Enter height of distress craft antenna per Section 3.4.15.1(b) above.
8. **Geographic Ranges:** Select "Radio."
9. Note the value of the computed Range.

b. **Plot Range Rings:** For each RFF that received the distress alert, use the Range Ring tool to plot a circle of the appropriate radius centered on the RFF. It is accessed via the button on the tool bar or via the menu "Edit – Quick Overlays – New – Range Rings". Data entries are as follows:

1. **DTG:** Enter the time of the distress alert.
2. **Center:** Enter the position of the receiving antenna.
3. **Radius:** Enter the computed range from the New Range/Bearing tool.

c. **Define Area Scenario(s):** Start a SAROPS "Run." Select the search object type(s) and enter the required information. Regions may be eliminated as in the

manual method above. Create "Area" scenario(s) by "tracing" the boundaries of the region(s) where the search object may be to create polygon(s) that approximate(s) the desired region(s). The "Auto" feature of the "Area" scenario definition screen is very useful for this purpose. Figure 3-9 on the next page shows a SAROPS "Area" scenario formed by two intersecting range rings with land areas eliminated.

d. **Run SAROPS Simulator:** Continue with the SAROPS data entry process. Skip the "Hazards" screen and the "Previous Searches" screen (unless some searching has already been done). Enter a "Simulation End Time" equal to the estimated commence search time. Edit the environmental data "Area of Interest" if and as appropriate. Select and retrieve the desired wind and current products from the Environmental Data Server (EDS). Run Simulator to compute a probability grid.

e. **Run SAROPS Planner:** Enter the on scene conditions and SRU information and run the Planner. Edit/Create Search Pattern to view the recommended search plan. Refresh and note the estimated POS. Modify or replace this plan if and as needed. Refresh and note the estimated POS after the desired modifications have been made. Figure 3-10 shows a SAROPS recommended search plan for the Area scenario of Figure 3-9. It shows the SAROPS probability grid and SAROPS' recommended search plan for a situation where the vessel SRU arrives on scene two hours after the incident, has two hours search endurance, and searches at 15 knots under good daylight visual conditions. The search object is assumed to be a 20-foot power boat. This plan probably needs some modification due to the shoreward portion of the pattern being in shoaling water, but otherwise it is a very good plan with an estimated POS of more than 96% for a 20-foot power boat.

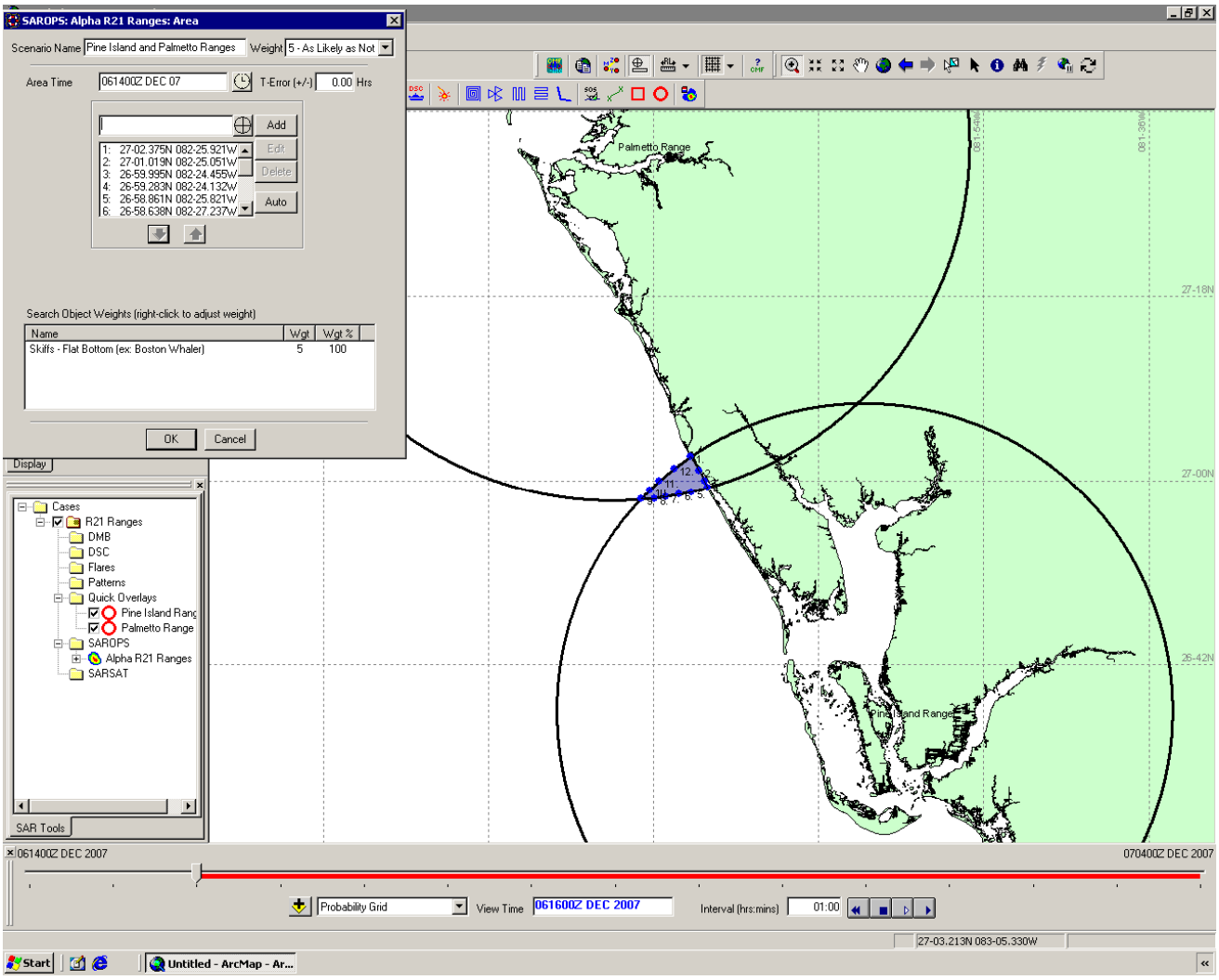

Figure 3-9 — SAR Tools Range Rings Plot with SAROPS Area Scenario

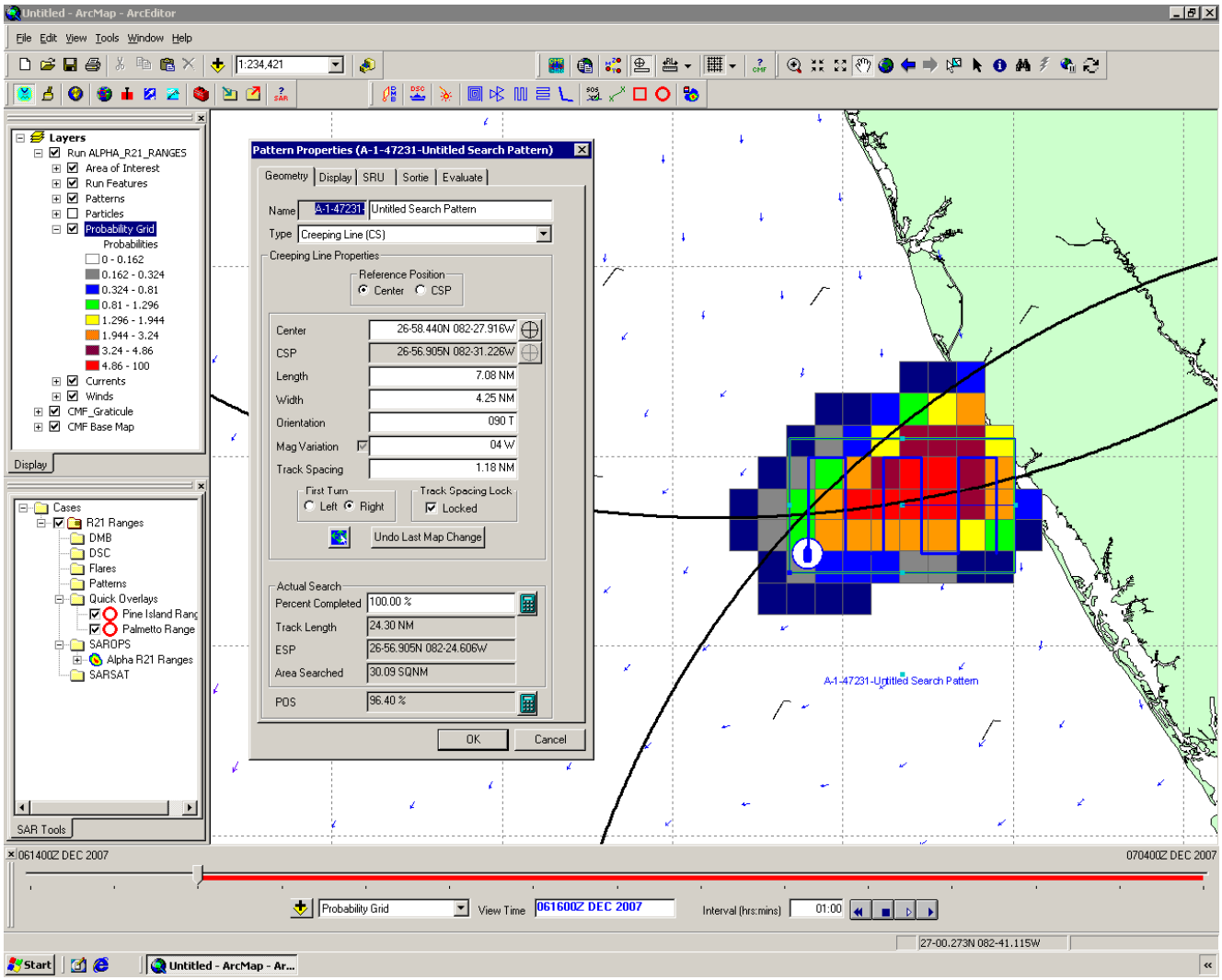

Figure 3-10 SAROPS Search Plan for 15-knot Vessel SRU Arriving two hours after Distress Broadcast with two hours On Scene Endurance Searching for a 20-foot Power Boat

(b) **Determining Search Areas for a Single LOB.** A single LOB from a VHF-FM transmission will generally provide sufficient information to plan and carry out a search. In this situation, the search area is determined by one or two factors: the estimated maximum distance to the distressed craft, which is used for the length of the area, and, if appropriate, the application of the bearing error for the RFF to either side of the LOB, which is used to find the width. These may be calculated either using SAR Tools or manually.

(1) **Manual Calculations:**

a. **Determining Search Area Length.** Calculate the distance from the receiving RFF to the distressed craft by using the procedure and equations in Paragraph 3.4.15.1(c)(1) above for estimating maximum reception ranges.

b. **Determining Search Area Width.** The width of the area to be searched is calculated using simple geometry for triangles.

1. Using the line of sight distance calculated above and applying the DF error angle (if known), the equation below produces the width of the initial search area. For R21, the error is ± 4 degrees or as otherwise stated for a particular RFF.

$$w = 2 \times d \times \tan(\theta)$$

Where ***w*** is the width of the search area in Nautical Miles,

d is the line of sight distance in Nautical Miles, and

θ is the DF error angle; for R21 this is 4º, unless otherwise stated for a particular RFF.

Example: For the R21 system, if the line of sight distance is the 32 NM (from example above); then the width of the search area would be 2 x 32 NM x tan(4º) (approx. 0.07) or 4.5 NM.

2. The small DF error angle for R21 significantly limits the width of the search area. For example, the distance from a distress craft transmitting from a 50-foot high antenna to a receiving RFF antenna of 1000-feet is only 47 NM, and the resulting width of the area is about 6.6 NM. These antenna heights are close to the high end of what will exist for the R21 RFF's and most distress craft.

3. Radio waves follow great circles, not rhumb lines. Rhumb lines plot as straight lines on charts that use the Mercator projection. The SAROPS/SAR Tools display and virtually all nautical charts use the Mercator projection. Long great circles plot as curves on these charts but short ones can hardly be distinguished from straight rhumb lines.

(a) The range and bearing tool provided with SAROPS will compute either Rhumbline or Great Circle routes. Ensure that the correct option (Great Circle) is selected when computing radio reception bearings and ranges; this will preclude any need to apply corrections.

(b) The difference between the great circle bearing shown by R21 and the rhumb line connecting the distressed craft with the RFF on a Mercator chart is usually negligible within the maximum reception range of most R21 RFFs. The higher the latitude and the larger the difference in the longitudes of the distressed craft and the RFF, the larger the difference between these bearings.

(c) Plotting the R21 LOB as a rhumb line on a Mercator chart may place it slightly north (in the northern hemisphere) of the great circle on which the distressed craft is positioned. If the LOB extended to the maximum theoretical reception range spans more than one degree of longitude, consideration should be given to increasing the width of the search area by

one or two tracks to the right or left of the LOB (whichever is in a southward direction) in order to compensate for the difference between great circle and rhumb line bearings.

c. **Positioning the Initial Search Area.** The triangular area just calculated is centered on the LOB and oriented in the same direction so that it extends from the RFF to the estimated maximum range. (NOTE: ***If visual horizon distances were used to calculate and plot the LOB, then a correction for distance must be made; the LOB should be extended so that its length is 1.05 times (5% greater than) the visual range***). The rectangle enclosing this triangle is the initial search area unless portions have been eliminated. Regions subject to possible elimination may include land, areas where the RFF is known to be "blind," if any, etc. If regions have been eliminated, then the initial search area is the rectangle enclosing the resulting polygon.

d. **Searching.** ***The initial search area computed in accordance with the manual steps given above shall be searched with a coverage factor of no less than 1.0. At a minimum, the initial search effort for this area shall consist of at least two search legs with a track spacing equal to one-half of the search area width, provided this will meet the coverage requirement of 1.0 or greater.*** In this case, the two legs will be parallel to the LOB and offset from it on either side by one-fourth of the search area's width. ***If a search object type cannot be otherwise determined, the default search object type (20-foot power boat) shall be used for sweep width and coverage factor determinations.***

e. **Search Pattern.** Because the widths of the resulting single LOB areas are relatively narrow, many searches for a single LOB can be conducted using a Trackline Single-unit Return (TSR) (two search legs) or a PS pattern having two search legs. For example, the daylight visual sweep width for the default search object for an uncorrelated distress (20-foot powerboat) is 4.3 NM for a helicopter searching at 500-feet with a 10 NM visibility, while it is 3.3 NM for a small boat SRU under the same conditions. With these sweep width values, two search legs will easily meet the coverage requirement for either SRU type.

(2) **SAROPS/SAR Tools (Preferred Method):**

a. SAROPS/SAR Tools provides an easy means to plot a line of bearing based on height of eye of observer (RFF audio antenna height) and search object (distress craft antenna height) with associated bearing error, create an "Area" scenario, compute a probability grid for the commence search time, and develop a near-optimal search plan. SAROPS/SAR Tools also allows the user to choose to plot the great circle bearing and radio line of sight range, which eliminates the need to apply any of the corrections detailed above for manual computations.

b. In SAROPS/SAR Tools the Range/Bearing Line tool is used. It is accessed via the button on the tool bar or via the menu "Edit – Quick Overlays – New – Range/Bearing Lines." The entries are the same information used in the manual method above with the addition of choosing the type of line. Data entries are as follows:

1. **Mode:** Direction/Range.
2. **Connect Type:** Great Circle.
3. **Start Position:** Enter the latitude/longitude of the RFF or use the selection tool.
4. **Bearing:** Input bearing of LOB.
5. **Bearing Error:** For R21 use 4 DEG unless otherwise stated for a particular RFF or region.
6. **Observer Height:** Enter height of RFF audio antenna.
7. **Object Height: Enter** height of distress craft antenna per Paragraph 3.4.15.1(b) above.
8. **Geographic Range:** Select "Radio."

c. An example of the appropriate entries and the resulting plot is shown in Figure 3-11 on the next page. Note the distance shown is the radio line of sight.

d. Start a SAROPS "run," select the appropriate search object types, and create an appropriate "Area" scenario. Figure 3-12 shows the SAROPS triangular "Area" scenario that corresponds to the LOB data plotted in Figure 3-11. The "Auto" feature for defining the corner points of an "Area" scenario allows the user to "trace" the LOB triangle very easily and quickly.

e. Figure 3-13 shows the SAROPS probability grid and recommended search plan for a single helicopter sortie with one hour of on scene endurance. The commence search time was assumed to be one hour after the distress call. The search object was assumed to be a 20-foot power boat. On scene conditions were assumed to be good for a daylight visual search. This is a very good search plan with an estimated 97% probability of success.

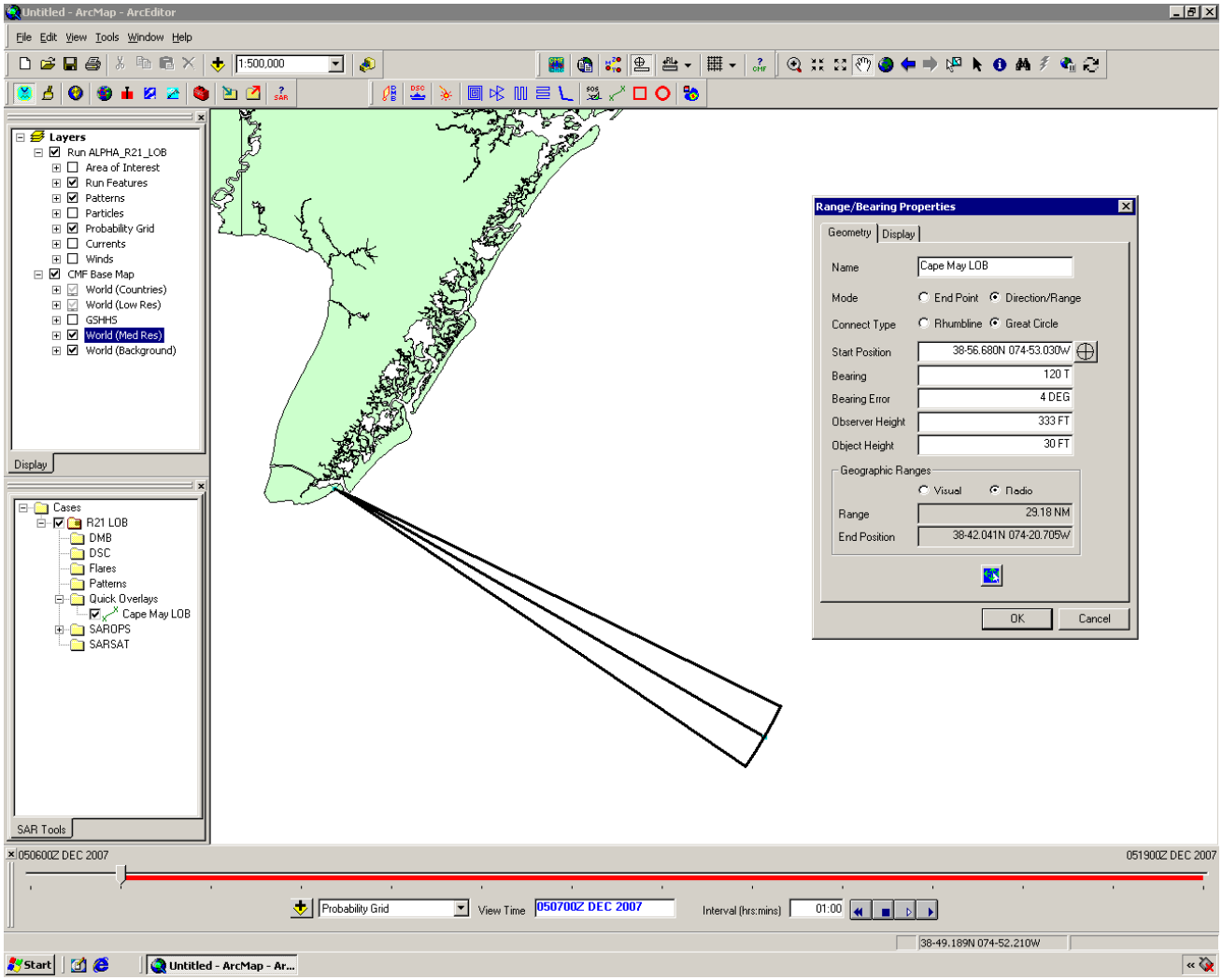

Figure 3-11 – SAROPS/SAR Tools Single LOB Range and Bearing Plot

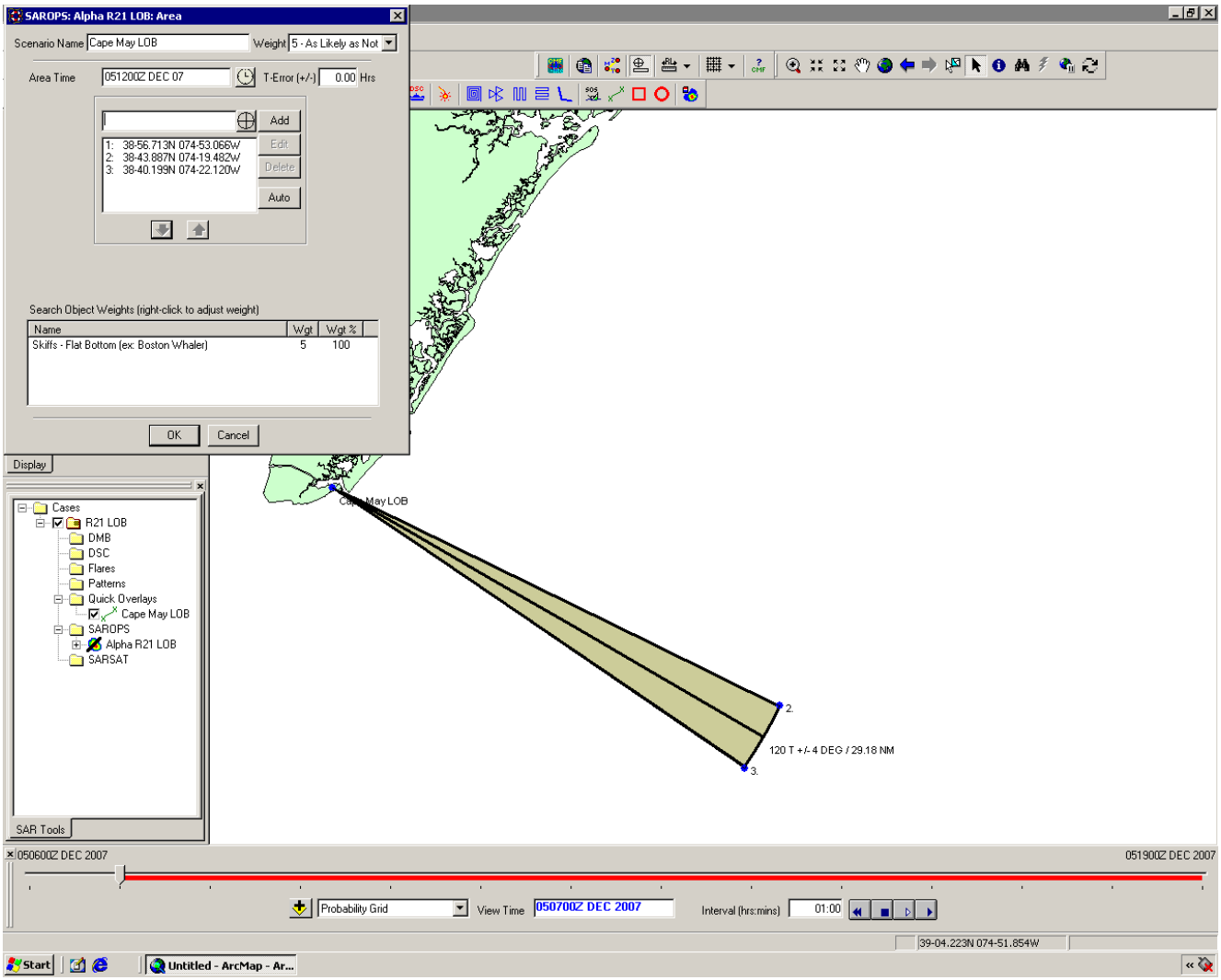

Figure 3-12 — SAROPS Area Scenario for a Single LOB

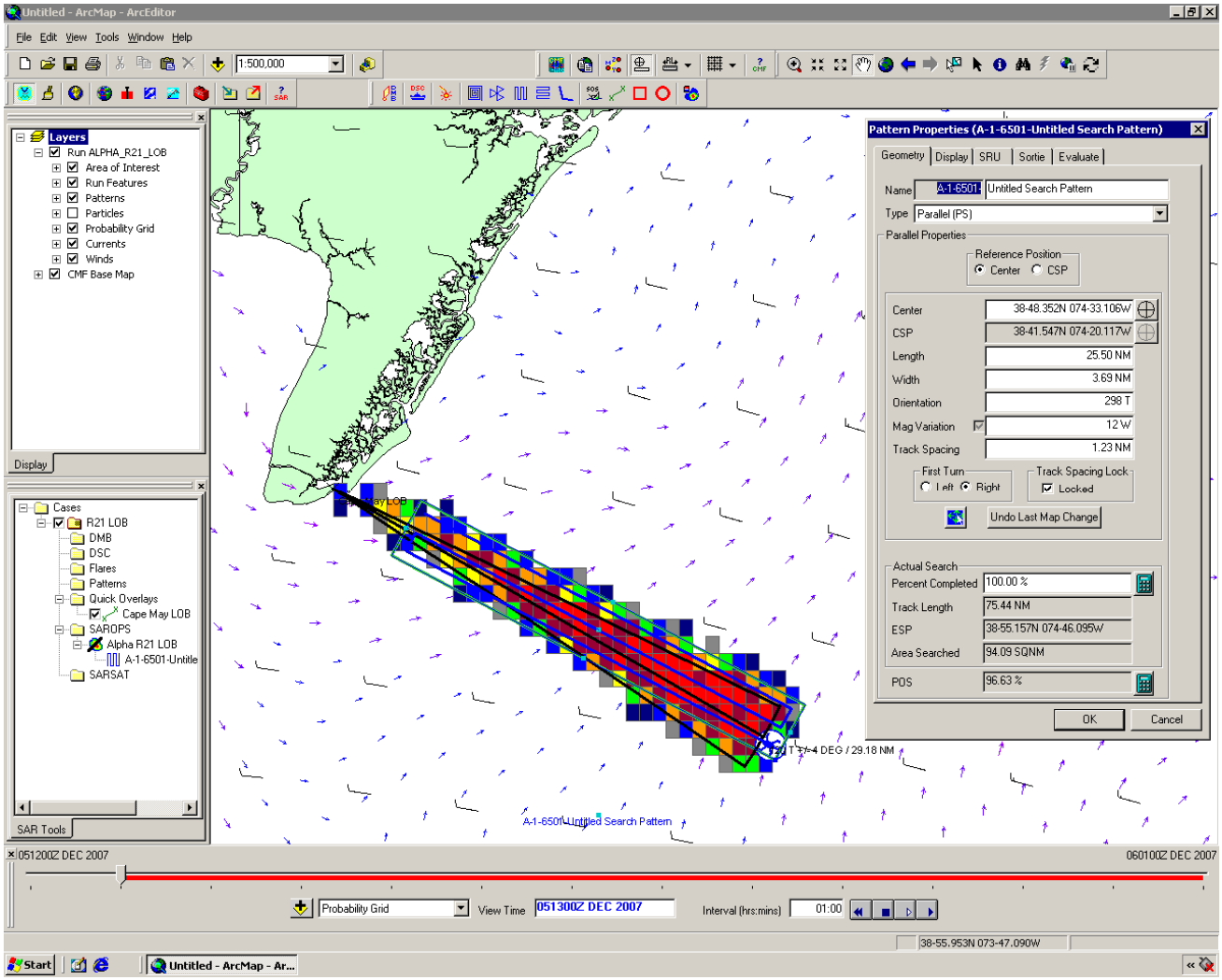

Figure 3-13 — SAROPS Search Plan for Helicopter Arriving one hour after Distress Broadcast with one hour On Scene Endurance Searching for a 20-foot Power Boat

(c) **Determining Search Areas for Multiple LOBs.** When it can be confirmed that simultaneous or nearly simultaneous LOBs from multiple RFFs are based on signals from the same transmitter that is broadcasting a distress alert, a fix on the transmitter's location can be obtained, within the bearing error of an RFF. This generally results in a small search area.

(1) Manual Calculations:

a. Plot each LOB and the lines that represent the bearing error of each RFF. The area enclosed by the intersecting bearing error lines is the area that should contain the search object as of the time of the distress broadcast.

b. Center a square or circle on this area that is sufficiently large to contain it. This is the initial search area. Plan an expanding square (SS) or sector (VS) search pattern that achieves a coverage factor of at least 1.0. If a single VS search does not

provide a coverage factor of 1.0, a second search should be conducted as described in Section 2.4.2.6(b)(1). If the search area size and/or dimensions are such that a different search pattern would be more appropriate, e.g. a parallel (PS) search pattern, then the other pattern should be employed for the initial search.

c. The coverage (C) for a six-sector VS pattern of radius (and leg length) R may be estimated by:

$$C = \frac{2.86 \times W}{R}$$

where ***W*** is the sweep width.

(2) SAROPS/SAR Tools (Preferred Method):

a. Use the Range/Bearing Line tool as described in 3.4.15.3(b)(2)b above. The tool is used as many times as needed to plot all LOBs associated with the distress transmission. If any of the LOBs fall short of crossing the others, the transmitter's antenna height may be increased to obtain a crossing. An example of crossing LOBs is shown in Figure 3-14.

b. Start a SAROPS "run," select the appropriate search objects, and create an "Area" scenario by defining a polygon that approximates the area formed by the crossing LOBs and their associated bearing error lines. Figure 3-14 shows an example involving two intersecting LOBs.

c. Figure 3-15 shows the SAROPS probability grid and recommended search plan for a single helicopter sortie with one hour of on scene endurance, searching for a 20-foot power boat with NVGs and illumination under good search conditions. The commence search time was assumed to be one hour after the distress call. This is a very good search plan with an estimated 98% probability of success.

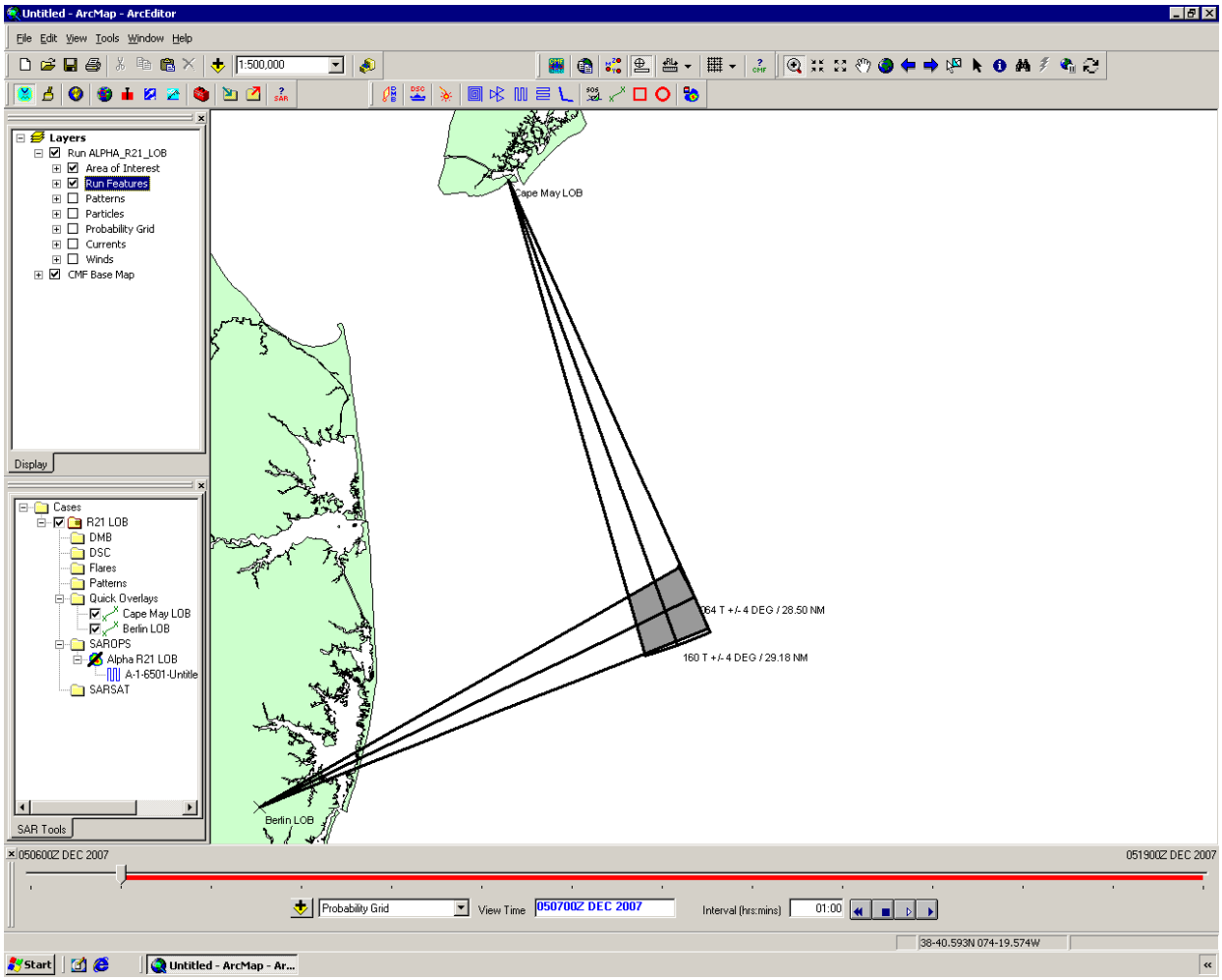

Figure 3-14 — SAROPS Area Scenario for Crossing LOBs

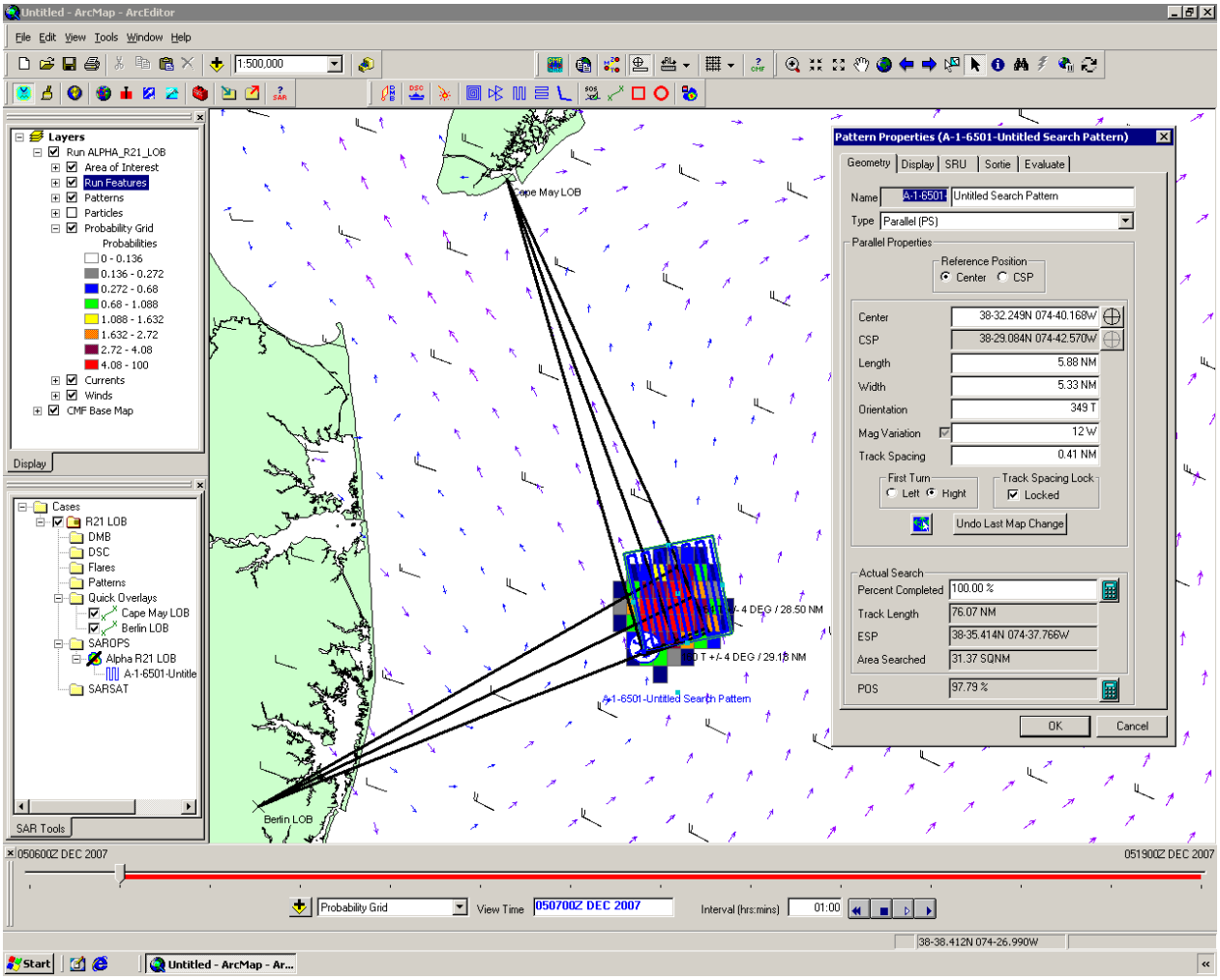

Figure 3-15—SAROPS Search Plan for Helicopter Arriving one hour after Distress Alert with one hour On Scene Endurance Searching for 20-foot Power Boat; Night Search with NVGs and Illumination.

(d) **Multiple non-crossing LOB's with nearly reciprocal or parallel bearings.** The distress incident areas for each LOB should be calculated separately. The maximum calculated distance for each LOB should provide the minimum for the other LOB. (See Figure 3-16 below) These separate areas should be enclosed by a single rectangle to form the area to be searched.

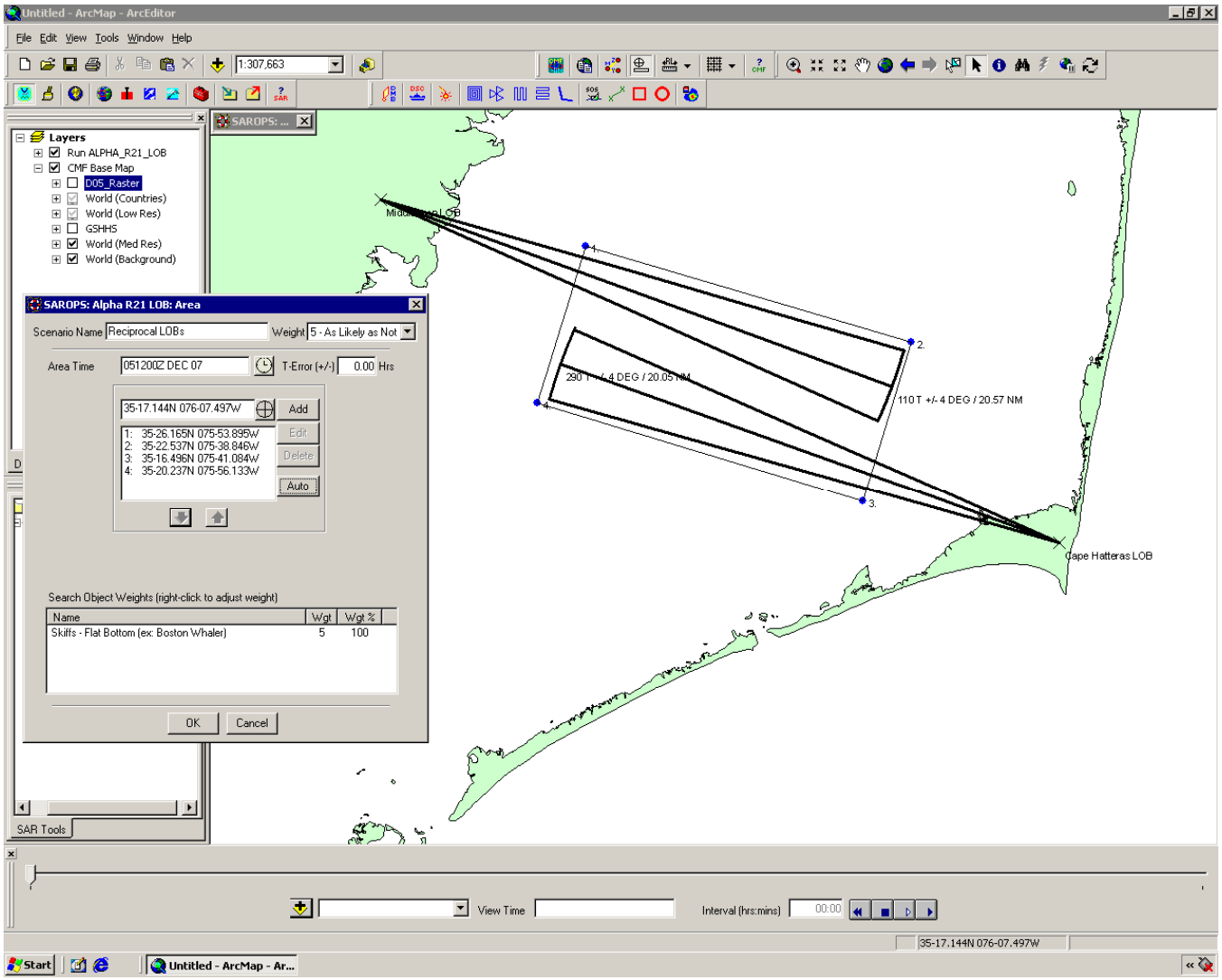

Figure 3-16 — Determining the Distress Alert Area for Nearly Reciprocal Bearings.

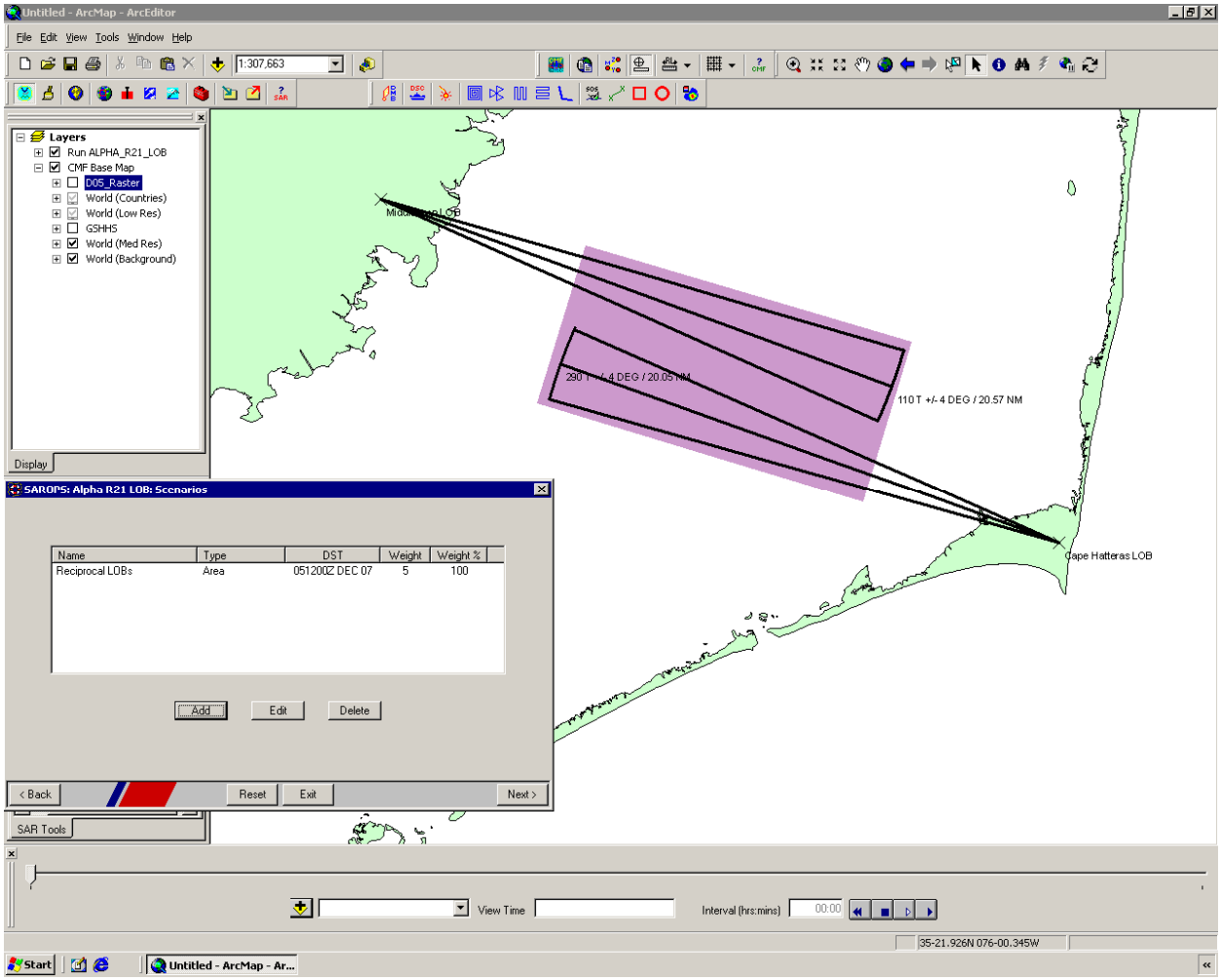

Figure 3-17 — SAROPS Area Scenario for Nearly Reciprocal Bearings

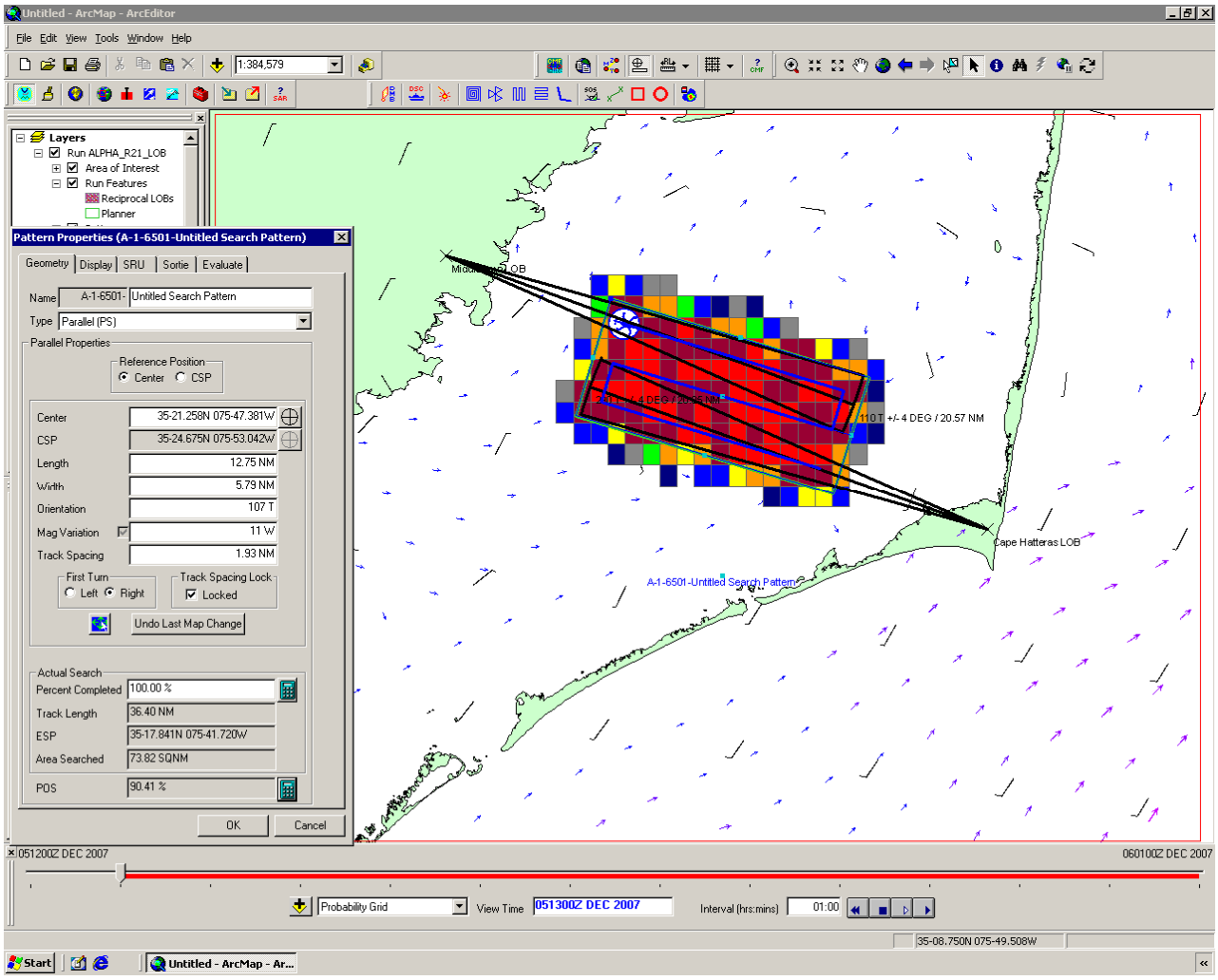

Figure 3-18—SAROPS Recommended Search Plan for Nearly Reciprocal Bearings

(e) **Multiple divergent LOB's to a single RFF.** There may be incidents where an RFF picks up a bounce or skip transmission that provides an erroneous LOB while another picks up the actual signal with and accurate LOB coming from significantly different directions. Each LOB should be considered individually. Emphasis should be given to the most logical LOB first. Local knowledge may provide clues as to potential for bounce or other anomalies.

(f) **Other Factors Affecting Estimation of a Distressed Craft's Location.**

(1) Both maximum reception range arcs and LOBs may be used together to estimate the location of a distress transmission, provided it can be confirmed that all are correlated with the same distress alert.

(2) ***If the initial search area cannot be covered before drift becomes a significant factor, a new search area that accounts for drift between the time of the distress alert and the time at which the SRU can be on scene must be computed in accordance with standard search planning procedures***. This generally means using SAROPS with one

or more "Area" scenarios, and possibly other scenarios depending on what is known from other sources. Also see the *International Aeronautical Search and Rescue (IAMSAR) Manual*, the *National Search and Rescue Supplement (NSS)* thereto, and Appendix H.

(3) Occasionally, atmospheric conditions cause "ducting" of VHF-FM signals. When this happens, the range at which these signals can be received becomes greatly extended. "Ducting" is often detected by hearing normal, non-distress traffic with information content indicating the transmitting craft are far away. For example, an RFF near Tampa, Florida, might "hear" traffic between a merchant vessel and a Mississippi River pilot-a distance of several hundred nautical miles. Refer to Section 2.5.6.2 for additional information.

(4) Because of its high frequency, VHF-FM is more susceptible to reflection or bounce from large tall structures than MF or HF signals. In some cases, this could affect the DF results such that the indicated direction points toward a structure rather than toward the distressed craft. Refer to Section 2.5.6.2 for additional information.

(5) As with all distress incidents, efforts to synthesize all of the available data from all sources to form one or a few self-consistent pictures ("scenarios") of the situation should be aggressively pursued. Although R21's capabilities will be very helpful, it is but one of potentially many sources of information bearing on a given case.

Section 3.5
Rescue Planning and Operations

3.5.1 Overview

The majority of Search and Rescue incidents reported to the Coast Guard do not involve a search. Most often the location of the vessel or person involved in the incident is known and the action required is a rescue or assistance.

3.5.2 Rescue Planning

Chapter 6 of Reference (a) and Chapter 6 of Volume II of Reference (b), provide most of the information required for rescue planning. As with a search effort, rescues should be carefully planned and action directed through a Rescue Action Plan. The format for a Rescue Action Plan is provided in Reference (a). Operations Risk Management (ORM) should be integrated into all SAR plans. (Refer to Section 1.2.3)

3.5.3 Rescue and the Maritime SAR Assistance Policy (MSAP)

Rescues encompass the full range of needs from distress to non-emergency incidents and should be evaluated and responded to in accordance with the provisions of Section 4.1 of this Addendum.

3.5.4 Disposition of Lifesaving Devices

3.5.4.1 Emergency Position-Indicating Radio Beacons (EPIRBs) should be recovered and/or the signal secured whenever possible at the time of a rescue.

(a) EPIRBs should not be left afloat as a DMB. If additional persons remain missing or there is a need to mark the position of a vessel or floating debris a DMB should be used. (See 2.6.4.5)

(b) EPIRBs left adrift at the conclusion of a SAR incident, continue to transmit. The signal produced may prevent another distress beacon from being properly tracked or heard.

(c) EPIRBs used in SAR incidents that operated improperly or failed should be recovered for analysis.

3.5.4.2 Lifesaving vessels (life rafts, lifeboats and lifesaving float devices). A number of SAR cases involve recovering persons from life rafts, lifeboats or a variety of lifesaving float devices. These lifesaving vessels are made of wood, metal, fiberglass, rubber, and other materials, which, if left adrift, pose a hazard to navigation, contribute to environmental pollution and create the possibility of future false alerts. Additionally, the lifesaving vessel may be carrying petroleum products (if motorized) or other materials hazardous to the environment.

(a) The preferred action is to recover and deliver lifesaving vessels ashore. This may be accomplished by the on scene rescue units, a Good Samaritan vessel, the owner, or if arranged by the owner, via commercial salvage.

(b) If conditions and circumstances do not permit a safe recovery by on scene rescue units, rescue personnel should make every effort to mark the lifesaving vessel. ***The marking shall clearly indicate that the Coast Guard has investigated the lifesaving vessel.***

Markings should be made to be visible and recognizable from the air and sea at a distance of 300 feet. A broadcast notice to mariners should be made appropriate to location, type of hazard and future disposition.

(c) ***For lifesaving vessels left adrift which pose a hazard to navigation, the owner shall be advised of the responsibility for marking and recovering the vessel including appropriate lighting for night.***

(d) ***For lifesaving vessels left adrift that are pollution hazards, the owner and/or responsible party shall be advised of responsibilities under the appropriate laws/regulations.*** Notify the cognizant Coast Guard Marine Safety Office.

(e) Destroying lifesaving vessels should only be carried out when there is no other reasonable option. Generally, destruction should only be done if the lifesaving vessel cannot be recovered or marked due to on scene circumstances, and its condition or it poses a particular hazard if left afloat.

Section 3.6
Measures of Search Effectiveness

Despite past reliance upon POD as a measure of search effectiveness, POS is a far more effective measure and the method of choice in the *IAMSAR Manual* and the *National SAR Supplement*.

3.6.1 Probability of Success (POS)

Although POD has been in the search planning vocabulary and used with the manual search planning method for many years, POS provides a much greater measure of search quality. POS is a statistically generated measure of search effectiveness and is the probability that a given search will succeed in locating the search object. POS depends on two factors: (1) the probability that the object is in the area searched (POC) and (2) the probability of detecting that object (POD) if it were there. In manual computations, probability of success is the product of the Probability of Containment and the Probability of Detection: POS = POC x POD. For a particular search, POS answers the question, "If the scenarios, POC, and POD values are an accurate reflection of the available information and data, what is/was the probability of finding the search object?" Cumulative POS is a measure of search effectiveness to date and answers the question, "If the scenarios, POC, and POD values are an accurate reflection of the available information and data, what is the probability that the search object would have been found by now?" Achieving a high cumulative POS value without locating the search object is an indication that either the object cannot be detected (e.g., because it is on the bottom in deep water) or that the scenarios, POC values, and/or POD values are suspect and a thorough review of all the available information is needed to determine whether it has been interpreted, computed, and used correctly.

3.6.1.1 POS in SAROPS. In SAROPS POS and cumulative POS are computed differently but have the same properties and uses. Each particle (simulated search object) in SAROPS carries a value called "Pfail." This is the probability that all searching to date would have failed to detect that particular particle. Pfail values are initially 1.0 prior to any searching, which indicates that no detection is possible and non-detection is certain when no searching has been done. Pfails are adjusted based on the distance between the search facility and the particle at the closest point of approach (CPA) using a lateral range curve. A lateral range curve is a graph of the POD for a single SRU pass by a search object as a function of the distance between them at CPA. Lateral range curves depend on all of the same factors as effective sweep width. In fact, the area under the graph of the lateral range curve equals the effective sweep width. This is the mathematical definition of sweep width using integral calculus. Lateral range curves are used for several reasons:

(a) They provide a more accurate model of the detection process. Instead of assigning the same average POD value to each particle in a search area as CASP did, or assuming a perfectly uniform POD over the search area as the manual method does, each particle's Pfail is adjusted based on the SRU's CPA from every track in the pattern. In other words, SAROPS performs a much more detailed assessment of detection probabilities than any previous method.

(b) Because the CPAs are computed based on the SRU's motion *and* the particle's motion during the search, the effects of the relative motion between search objects and SRUs are

taken into account. In all previous methods, motion during the search was not considered and the effect was the same as covering the entire search area in an instant at the datum time. Whenever the creep rate and average drift rate have about the same order of magnitude, relative motion can have a significant effect on POS.

SAROPS computes POS by finding the sum of all Pfail values, dividing that sum by the total number of particles, and then subtracting the result from 1.0. No POD or POC values for fixed search areas are required, or even computable. Note: This method of computing POS is used when all scenario and search object type weights are the same. Assigning different weights to scenarios or search object types will affect POS computations in SAROPS appropriately, but the added mathematics is not necessary for understanding the basics.

3.6.1.2 POD (Probability of Detection) is, traditionally, the statistical measure of average detection performance over a searched area. It is a function of sweep width, level of effort and size of the area searched. POD is a "conditional probability." The "condition" is an assumption that the search object is definitely in the area searched. POD answers the question, "If the search object was in the searched area at the time of the search, what was the probability of detecting it?"

POD has two other forms. One of these is the instantaneous or "one glimpse" POD. In addition to all the factors that affect sweep width, the instantaneous or one-glimpse visual POD is primarily a function of the true range from the searcher to the search object at the moment of the glimpse in the search object's direction. The other form is the lateral range POD. As the name implies, in addition to all the factors affecting sweep width, it is primarily a function of the lateral range, or distance at CPA, from the searcher to the search object. It is a result of the cumulative effects of all the one-glimpse POD values as the SRU approaches the search object from some distance beyond the maximum detection range, passes it, and continues on to some distance beyond the maximum detection range. The traditional average POD over a searched area is a result of the cumulative effects of all the one-glimpse PODs, or, equivalently, the cumulative effects of all the lateral range PODs from each search leg, while the SRU was in the search area.

SAROPS does not report POD values for search areas. Since it works by using lateral range PODs at the individual SRU/search leg/particle CPA level that accounts for time and relative motion, the average POD for a geographically fixed search area is no longer as useful a concept. Lateral range curves may extend beyond search area boundaries thereby adjusting Pfail values on particles that are never in the search area. This is realistic since in actual operations search objects are sometimes detected outside a search area from within the search area. During the search, particles will be drifting into the search area while other particles drift out of it. Some particles that cross search area boundaries during the search will be approached closely enough by the SRU for detection to be possible while this will not be the case for others. It is even possible for some particles that stay in the search area the entire time to escape any possibility of detection due to the effects of relative motion. These effects have been known ever since formal search planning methods were first developed, but until now there was no way to account for them so simpler computations based on static situations were used as the best available approximation.

3.6.1.3 POC (Probability of Containment) is described as the probability that the search object(s) are contained in a particular area. Using computer simulation (SAROPS) we can develop

containment probabilities (POC) for a particular instant in time based upon drift and scenario assumptions. For example, POC values for each cell in a probability grid may be viewed for each recorded time step.

SAROPS does not report POC values for search areas for the same reasons it does not report POD values for search areas. Nevertheless, Coverage, POD, and POC are still useful concepts for discussing POS and area versus coverage tradeoffs in general terms.

3.6.2 The Value of Using POS

POS calculates search effectiveness by incorporating POC with the POD. POD only measures detection effectiveness; that is, it is used to estimate how well a search area was searched, but it does not incorporate the likelihood that the object will actually be in the particular area searched, or, in SAROPS terms, the chances that the search facility will approach the object closely enough to make detection possible. POS does.

3.6.2.1 The following examples will clarify this discussion:

(a) Searching an area that has no chance of containing the search object (POC = 0) will not be successful no matter how high the POD. Even if POD was 100% (which is not realistic) the POS is still zero (0 x 1 = 0).

(b) To give a more realistic example, if there is a 50% chance of the search object being in an area, then searching that area with a coverage factor of 1.0 (POD of 78%) produces a POS of 39% (.5 x .78 = .39). Even if POD was 100% (again unrealistic), the POS for this search rises to only 50% (.5 x 1 = .5) and no further because there is still a 50% chance that the search object was not in the search area.

3.6.2.2 POS balances options of looking very carefully in a small area for the object(s) against looking less thoroughly over a larger area for the same object(s). As an analogy, think of looking for a misplaced set of keys. One could meticulously look for the keys in the sofa; moving pillows, pulling apart cushions, putting one's hands under the sofa and in the joints of the furniture (high POD but low POC). Or, the same time could be used searching for the keys by scanning the tops of the sofa, mantel, bookcase and the rest of the family room and kitchen, concentrating on the most likely spots (lower POD but high POC). If it were known that the keys were lost in the sofa, option one would yield a higher POS. If there was uncertainty about where the keys were last seen or lost, then option two would probably yield a higher POS.

3.6.3 Determining POS

3.6.3.1 Manual Solution. The manual solution always incorporated POC and POS. However, for many years it did so in a way that was hidden from the search planner. Search planners, prior to the advent of CASP, the *IAMSAR Manual*, and now SAROPS, did not use POC and POS because there was no practical way to compute them manually. Unfortunately, this left an incorrect impression that POD was the sole statistic of interest in terms of measuring search effectiveness. It is not. As previously stated, POS is the measure of overall search quality/effectiveness.

3.6.3.2 SAROPS Solution. SAROPS is designed to provide a near-optimal search plan that maximizes POS while still de-conflicting search areas to prevent inappropriate overlaps and imposing minimum track space restrictions according to SRU type. The SAROPS Planner is essentially an infinite loop that keeps trying to improve its search plan solution by finding a new search plan that produces a higher POS than any previous plan it has computed. However, Planner is stopped after 90 seconds and returns the best plan it has found up to that point. Planner works well for small numbers of SRUs. When larger numbers of SRUs are introduced, the Planner may be unable to find a fully de-conflicted near-optimal search plan in 90 seconds. ***The usual result is that inappropriately overlapping areas are returned and must be straightened by human hands or Planner must be given more time.*** The user may go "Back" to the SRU screen and select "Run Planner" again, without changing anything, and Planner will use the previous solution as its new starting point and work for another 90 seconds. Usually a few repetitions will be enough.

Section 3.7
Aspects of Survival

3.7.1 The Probability of Survival Decision Aid (PSDA)

3.7.1.1 Use of the Probability of Survival Decision Aid. ***The PSDA application shall be used for all cases involving persons in the water (PIW) and where persons are at risk of hypothermia or dehydration when not immersed.*** PSDA is also useful in determining how environmental factors may affect Coast Guard personnel during operations and training evolutions.

(a) All Areas, Districts, Sectors, Air Stations, National SAR School, and the National Motor Lifeboat School are authorized to use the PSDA hypothermia and dehydration software.

(b) ***Electronic or hard copies of the inputs and results of running the model shall be included in all SAR cases files in which PSDA is used as part of the case suspension decision.***

(c) PSDA is a reliable means for the prediction of survival times from the effects of hypothermia or dehydration. Times provided are not considered as absolute values, but rather as guidelines for search planning and case suspension. PSDA should be used in conjunction with the existing hypothermia graph (Figure N-14) in Reference (b). SAR planners should ensure alternate means of determining hypothermia effects, such as Figure N-14 in Reference (b), are available in the event the PSDA is unavailable.

(d) PSDA software can be accessed through any of the SAROPS servers via a Common Access Card (CAC) and PIN. Once CMF-L has been launched, the PSDA hot button can be found in the USCG SAR Tools tool bar. The PSDA button is a red and white life ring that is titled 'Survivability Tool'. It also resides on SAROPS servers as a desktop link.

(e) PSDA has a built in HELP function that will answer most user questions. Questions about the entry of values in the PSDA application can be addressed by contacting the National Search and Rescue School.

3.7.1.2 Understanding Probability of Survival Decision Aid Results. The U.S. Army Research Institute for Environmental Medicine (USARIEM) developed the PSDA to predict survival times for cold-water immersion along with and cold and warm air exposure. PSDA predicts functional time and survival time based upon the cooling of the body's core and water lost by sweating, respiration, and urine production. These times are based upon an individual's physical characteristics, clothing, weather, and sea conditions. The functional time predicted by PSDA is the time elapsed after initial exposure when a person's body core temperature decreases to the end of mild hypothermia at 34°C (93.2°F). At the functional time, the person is assumed to have lost the cognitive capacity to prolong their life. Depending on the water temperature, this may be well past the time at which the person's extremities have been incapacitated by lowered muscle temperatures. Survival time is the time after immersion when the person's core body temperature falls to the end of moderate hypothermia 28°C (82.4°F). A person with a core temperature of 28°C (82.4°F) is expected to lose consciousness. An immersed unconscious person is unable to maintain an airway, which quickly results in drowning. PSDA also calculates total dehydration (water loss) by sweat production, loss of water to air in the lungs (respiratory loss) and a constant daily urine production of 0.5 liters per

day. Dehydration Survival Time is reached when a person has lost 20% of their body weight.

3.7.1.3 Limitations of the PSDA. PSDA is a mathematical model that simulates the heat and water balances (gains versus losses) of a person based on current scientific understanding of human physiology. PSDA assumes that a personal flotation device is used that allows a passive person to maintain an open airway. A person-in-the-water is normally considered to be immersed to the neck, however SAR planners should consider that the person may be able to reduce his/her rate of heat loss by climbing aboard flotsam. The person is also assumed to have a normal cooling response to cold (i.e., not suffering from trauma or compromising medical conditions). PSDA also does not account for the effects of cold shock, cold incapacitation, and circum-rescue collapse, medications, drugs, alcohol, sleeplessness, and circadian hormonal cycles. These factors all have a negative effect on survival.

(a) The thermal physiological model includes six interconnected body segments (head, torso, arms, hands, legs and feet, modeled as cylinders. Each segment consists of a core, surrounded by muscle, fat, skin and clothing layers. PSDA balances heat production due to metabolism (which assumes a passive person who is shivering) against heat loss due to heat conduction through the fat, skin, clothing layers, convective heat loss to the surrounding air, and water environment. The model also simulates the transport of heat from the body core to the extremities through blood circulation and the loss of heat transport due to blood vessel constriction as the limbs become colder. Heat loss will overwhelm heat production in a cold environment, so cold survival time is largely determined by the rate of net heat loss. If the environment is somewhat warmer, heat produced by the person may balance heat loss (for example, if the person is wearing heavy clothing) and survival time is governed by the person's ability to maintain a high rate of metabolism. The factors affecting the onset of exhaustion are poorly understood by the physiological community, so the hypothermic survival time has been limited to 120 hours or less. The 120 hour threshold was set by the PSDA developer, based upon the maximum observed immersed survival time (90 hours) from existing CG records, with a 33% added margin of safety.

(b) In warm air conditions (land or boat) a second physiological model in PSDA predicts the net water loss from the body through the skin (sweat loss), lungs (respiratory loss) and basal metabolic (urine) production. The data available for confirmation of the water loss model was confined to laboratory experiments, and the documentation of survival at high dehydration levels is poor. The PSDA developer set a maximum expectation of survival at ten days (240 hours) based on recommendations of earlier researchers. When the dehydration survival time is given as 240 hours, it means that the expected dehydration level is not expected to reach 20% of body weight, and that other factors should be considered by the SAR planners. The prediction of long-term sweat or water loss is complicated by changes in sweating rate over time (due to day / night / cloud cover / temperatures / rain / fatigue), the possibility that the person may be able to find supplemental water sources (such as fish or rain fall), and the near-absence of long-term physiological data under realistic conditions. Near its limits, PSDA accuracy is expected to be low.

(c) The input ranges of weight, height, and percent body fat of the individual account for 95% of the US population: 110-267 pounds, 59 –74 inches, and 5 to 50% body fat. PSDA

inputs are sex, weight, height, body fat and clothing insulations, since these are the significant factors for survival.

3.7.2 The Four Stages of Cold Water Immersion

There are four stages of immersion in which death can occur in cold waters. (1) The initial Cold Shock Response can kill within 1-3 minutes of immersion by respiratory or cardiac problems leading to drowning or sudden death. (2) Cold Incapacitation can kill with 5-30 minutes of immersion by impairing physical performance, thus leading to the inability to self-help, swimming failure, and then drowning. (3) Hypothermia occurs after 20-30 minutes of immersion and will progress until shivering stops and unconsciousness occurs. This will lead to drowning if the head is not held above water, or eventual cardiac standstill if the head is held above water. (4) Circum-Rescue Collapse can occur just prior to, or during, rescue. It can also occur minutes to several hours post-rescue. Symptoms ranging from syncope (fainting) to death, due to cardiac standstill, occur due to loss of arterial blood pressure or the rapid and uncontrolled return of cold blood from the limbs through the unstable heart leading to cardiac arrest during circum-rescue collapse.

3.7.2.1 Stage 1: Initial Immersion Cold Shock. Sudden immersion into cold water stimulates a large aspiratory gasp response (involving one to several breaths) that may be followed by hyperventilation plus substantial increase in blood pressure and heart rate. If entry into the water involves complete head-under submersion, the gasp reflex could result in immediate drowning. Subsequent hyperventilation will normally diminish within seconds to minutes but could be increased and exaggerated due to emotional stress and panic. Uncontrolled hyperventilation can cause numbness, muscle weakness or even fainting, leading to drowning. Either of these respiratory responses can lead to aspiration of water into the lungs; panic, with subsequent drowning. Cold shock can occur in water colder than 20 ^{o}C (68^{o}F) with symptoms increasing as water temperature decrease to freezing. Healthy individuals may succumb to cold shock through uncontrolled respiratory responses, while those with underlying cardiac disease may experience sudden death due to cardiac arrest or ventricular fibrillation (uncoordinated heart beats). To counteract this phenomenon, control the entry into cold water by slowly entering and keep the head from being submersed; followed by focusing on surviving the first minute by not panicking and consciously getting breathing under control.

3.7.2.2 Stage 2: Cold Incapacitation. In addition to the short-term Cold Shock response, the body attempts to preserve the normal core temperature of 37°C (98.6°F) by decreasing heat loss and increasing heat production. Vasoconstriction in the limbs shunts blood from the extremities to the core in order to decrease body core heat loss through the limbs; this allows limb tissue to cool rapidly. Due to intense cooling of muscle and nerve tissues, the victim experiences muscular failure and is no longer able to swim, maintain posture or position in the water, or use the hands meaningfully. In water near 0°C (32°F), incapacitation can occur within 5-15 minutes. Approximately a third of all cold immersion deaths in 5 to15°C waters occur during Cold Shock and Cold Incapacitation stages.

3.7.2.3 Stage 3: Hypothermia. Continued excess of heat loss versus heat production will eventually result in decrease of core temperature (primarily the heart, lungs and brain) to clinically hypothermic levels of 35°C. Core cooling can occur when a person is immersed in waters of temperatures below 22^{o}C (72^{o}F). The rate of cooling depends on water temperature, body metabolism and fatness, as well as external insulation provided by clothing and survival gear.

(a) Hypothermia is divided by body core temperature into three sub stages of mild, moderate and severe hypothermia. These stages are defined by the State of Alaska State Cold Injuries Guidelines (downloadable from http://www.chems.alaska.gov/EMS/Downloads_Rx.htm), which also provide guidelines for basic to advance treatment of hypothermia.

(b) During **Mild Hypothermia** (35°C to 32°C, 95°F to 90°F) the body's thermoregulatory system functions normally, thus shivering will normally increase in intensity as core temperature drops (unless a limited energy supply inhibits muscular activity). Physical disabilities will be seen first with fine motor movements followed by gross motor movement failure. Mental impairment will also be noted as core temperature approaches 32°C. Thus the victim is experiencing lost of coordination and judgment and is nearing the limits of self-help. The person would have significant problems with: climbing into a life raft, climbing a ladder, lighting a flare, or performing manual tasks.

(c) During **Moderate Hypothermia** the core temperature drops from 32°C to 28°C (82.4°F) and thermoregulatory responses are waning or absent. In this stage, shivering will decrease in intensity and eventually stop, and consciousness will be lost (at about 30°C). Possible cardiac arrhythmia (irregular heartbeats) and sensitivity to ventricular fibrillation deceased consciousness or loss of consciousness occurs.

(d) **Severe Hypothermia** occurs when the core temperature drops below 28°C (82.4°F); at this stage death is imminent. Acid-base abnormalities occur in the blood, and the cold heart will eventually go into ventricular fibrillation and subsequent full cardiac arrest. This cardiac standstill can occur spontaneously (at heart temperatures approaching 25°C) or can be prematurely induced by mechanical stimulation at higher temperatures (up to 28°C). Thus it is important to be as gentle as possible when handling a moderate-to-severely hypothermic patient. During this stage of hypothermia, metabolism is minimal and cardio respiratory activity may be difficult to document, and a patient in full arrest may survive for an extended period due to the protective effect of brain cooling. Thus, unless there are obvious signs of fatal injury, victims are not declared dead until they are re-warmed to a core temperature of at least 32°C and further resuscitation efforts fail.

3.7.2.4 Stage 4: Circum-Rescue Collapse. The hypothermic victim may experience symptoms ranging from fainting to cardiac arrest during the period just prior to rescue, during rescue or within minutes to hours post-rescue. Prior to imminent rescue, mental relaxation and decreased output of stress hormones may result in a drop of blood pressure resulting in fainting and drowning. The act of rescue itself may also cause sudden collapse. Pulling a victim out of the water in a vertical position removes the hydrostatic squeeze around the lower limbs and may cause blood pooling in the these extremities and subsequent decreased blood pressure. This extra cardiac work or rough handling may induce a reflex cardiac arrest of the cold heart. Finally, death may occur within minutes to hours post-rescue. A rescued victim may be severely compromised with cold alkaline or acidic blood in the extremities, a heart extremely prone to failure, decrease or loss of consciousness, low blood volume (hypovolemia). Sudden redistribution of blood to the extremities (especially the lower extremities) may cause collapse through decreased blood pressure and cardiovascular instability, sudden return of metabolic byproducts to the irritable heart, or continued decrease in temperature (afterdrop) of an irritable heart. Core temperature will continue to drop and the heart reacts by tachycardia

(extremely high heart rate) or fibrillation. Up to twenty percent of those recovered alive, die during due to circum-rescue complications, either before and during rescue or within hours after rescue.

3.7.2.5 Notes on Ice Water Immersion. Even in ice water, a victim may not become unconscious due to hypothermia if a PFD is worn or some other factor prevents the need for vigorous exercise to keep from drowning. If the head is kept above water at this point, the victim could still survive for up to one hour more before the heart stops, as long as the sea is relatively calm and waves do not wash over the mouth. The following slogan can be used to educate the public that they are not necessarily going to die if suddenly immersed in cold water:

"If you fall into ice cold water you have **1 Minute – 10 Minutes – 1 Hour.**"

(a) **1 Minute to get your breathing under control**, don't panic.

(b) **10 Minutes of meaningful movement** to get out of the water or attain a stable situation.

(c) **Up to 1 Hour until you become unconscious from hypothermia**, if you don't panic and struggle unnecessarily. And if you are warming a PFD, it may take another 1 Hour until the heart stops due to hypothermia.

3.7.3 Near Drowning

3.7.3.1 Medical Considerations: Any person who has been submerged and unconscious is considered to be in a near drowning incident. ***All persons who were submerged and unconscious should be transported to a hospital, even if he or she has regained consciousness. Accumulation of fluids in the lungs (pulmonary edema) may develop 6 - 24 hours after submersion.*** If a person has been under water for **less** than one hour, full resuscitative effort should be employed. If a person has been under water for **more** than one hour, resuscitative efforts are usually unsuccessful. There is generally little differences between fresh and salt water near drowning regarding outcome or treatment, however aspiration of even moderate amounts of salt water (and slightly larger amounts of fresh water) into the lungs may result in severe pulmonary complications within a few hours. These manifest with an increasing breathing and heart rate. Neck injuries and their associated risk of spinal cord injuries are common after diving into shallow water or when a boat strikes an object, therefore it is best to maintain the survivor's body in a horizontal position during removal from the water, if it does not delay rescue.

3.7.3.2 Submersions: Submersions greater than 6 minutes in waters colder than 70^{o}F (21^{o}C) have a better chance of survival than those submerged in warmer waters; the colder the water the better the chance of survival.

3.7.3.3 Dehydration: After the urgency of air and thermal balance the survivor needs to replenish its body's water needs. A person in normal, neutral conditions loses about 1 pint of water per day through the skin (insensible water lost), another pint is lost by saturating the inhaled air by the lungs, another pint of water is lost as urine due the waste products of metabolism. Thus the total base loss of water per day is about 3 pints or 1.5 liters. Factors that will increase water loss include: 1) increased sweating due to exercise, fever, high air temperature and humidly; 2) increased respiratory loss due to exercise, low humidity, high wind speed; 3) increased urine loss due to diabetes, hypothermia, immersion, alcohol and sea water ingestion; 4) and other water losses (e.g., diarrhea, or blood loss). A person can offset these losses by drinking fresh

water and to lesser extend from the metabolism of non-protein rich food. The accepted minimum daily requirement if additional water losses are not inquired is about 1 quart; with water conservation (keeping cool, resting, and remaining in the shade) this can be reduced to about 1 pint.

3.7.3.4 Consequences of Body Water Loss: When the water loss exceeds about 5% of body weight, the person may experience headaches, irritability and feeling of light-headedness. The skin loses some of its elasticity, when pinched is slow to return to its previous position. With water loss in the 8-10% range, performance deteriorates significantly, with dizziness, faintness, and rapid pulse and shallow breathing. Beyond 10% body loss of water, deterioration increases and hallucination and delirium become common. Death occurs with acute losses in the range of 15 to 20% of body weight.

3.7.3.5 Drinking Seawater: "There is an immediate slaking of the thirst, followed quite soon by an exacerbation of thirst that requires more copious draughts of seawater, and then still more. The victim then becomes silent and apathetic 'with a peculiar fixed and glassy staring expression in the eyes.' The condition of the lips, mouth and tongue worsens, and a peculiarly offensive odor of the breath has been described. Within an hour or two delirium sets in, quiet at first, but later violent, and if unrestrained the victim may jump overboard. If restrained, consciousness is gradually lost; the color of the face changes, and froth appears at the corner of the mouth. Death follows shortly after."

3.7.4 Will to Live

The will to live is defined as the desire to live despite seemly insurmountable mental and/or physical obstacles and varies from one individual to another. The attributes that have the greatest effect on a person's will to live are their attitude and physical condition at the time of the incident. The will to live is one of the greatest intangibles for SAR planners to consider when planning or suspending a search. Survival times are calculated minimums based on an average person, and the data does not take into consideration the will to live, which will differ, for every person depending on their situation. The will to live is extremely hard to define under any circumstances, but it is a part of the "Art of Search and Rescue versus science" and should be considered throughout the case

3.7.4.1 Controllers should do their detective work by talking with family members, friends and/or co-workers. Questions should be posed tactfully about any significant emotional events (i.e. death in family, divorce, birth of child, newlywed) that may have occurred recently. This can provide a gauge of the victim's mental and physical state when he or she was last seen.

3.7.4.2 ***Case suspensions should not be solely based on PSDA.*** Times of possible case suspensions should be an optimistic guess that a person has a strong 'will to live'. Conversations with family members, friends, and/or co-workers will provide the best indication of this. Again, every case is different and every person's will to live is different and should be an educated guess weighing all internal and external factors.

3.7.4.3 With the proper attitude, people can exhibit exceptional physical and mental strength not normally thought possible.

Section 3.8
Conclusion of SAR Operations

There are three terms used to indicate the status of search and rescue cases; *Case Closed*, *Case Pends*, and *Active Search Suspended Pending Further Developments*. Each status has particular criterion associated with its use. The definitions and criterion for each status are described in the following sections.

3.8.1 Case Closed

When the search object(s) is located, assistance to the object is completed, and no other SAR issues arise, the search and rescue case is considered closed. No further SAR related action by the Coast Guard is necessary or contemplated.

3.8.1.1 ***Persons who are the object of a search must all be accounted for in order for a case to be closed.*** When persons remain missing at the conclusion of SAR efforts, the case cannot be closed.

3.8.1.2 ***Personnel in MEDEVAC cases must either be transferred to other medical authorities or no longer require medical assistance once delivered ashore for the case to be closed***.

3.8.1.3 When the object of a SAR case is property, the case may be closed when the object no longer requires SAR assistance. For vessels aground, sunk or in other condition requiring what is determined to be purely salvage assistance, the case may be closed.

3.8.2 Case Pends

This term refers to an open case in which the search object has not yet been located and not all search efforts have been completed, or the search object is located, but rescue or assistance efforts have not yet been undertaken or concluded. Further action by the Coast Guard is necessary and planned. (Action may include coordination of other agency assets.)

3.8.3 Active Search Suspended (ACTSUS) Pending Further Developments

When a SAR case cannot be closed and further search efforts appear futile, the search may be discontinued. The SAR case will remain open until the object of the search is located. If new information is received indicating the object of the search may not have been in the areas searched, or pertinent details of the search object were other than those previously reported, the search may be resumed.

3.8.3.1 ***The decision to grant ACTSUS is a judgment call. It must be based on a careful analysis of the factors of the particular case.*** The authority to grant ACTSUS carries with it the responsibility for final review of the SAR efforts, requiring knowledge of search planning and a clear understanding of the measures of search effectiveness (see Section 3.6.). ***ACTSUS authority inherently rests with the SAR Coordinator. At the discretion of the SAR Coordinator, ACTSUS authority may be delegated in writing as detailed below. Such delegation shall take into account that in general the level for ACTSUS authority should reside in the SAR chain of command one level above the SMC.***

(a) ***ACTSUS authority may be delegated to Sector Commanders. Sector Commanders may further delegate authority to the Deputy Sector Commander or the Sector Chief of***

Response. District Chief of Incident Management shall be advised if this delegation is made.

(1) Delegation of each individual with ACTSUS authority within the District and Sector shall be re-issued upon change of command of the SC or Sector Commander. If only the Sector Commander changes, this is applicable for those personnel within that particular Sector.

(b) Consideration should be given to limiting delegated authority based on scope and severity of cases. ***Prior to ACTSUS being granted for cases involving persons known to be missing, the District (drm) at a minimum shall be briefed***.

(c) ***In the absence of the most junior delegated ACTSUS authority recognized by the SAR Coordinator (Sector Response Chief/Commander in most cases), ACTSUS authority shall revert to the next most senior authorized ACTSUS authority in the chain of command***.

3.8.3.2 A sample SAR Case Suspension Checklist is included in Appendix G. This checklist or a locally produced checklist is recommended as an integral part of the suspension decision process.

3.8.4 Case Status Actions by Other SAR Authorities when Coast Guard Units are Assisting

When a person from another agency is the SMC for a search and Coast Guard units are participating in the effort, the Coast Guard will normally cease all efforts when the SMC either closes or suspends the case.

3.8.4.1 Typical Other Agency SMC Situations. Most search operations performed by Coast Guard units will be for situations where the Coast Guard is SMC. There will however be times when others will be SMC:

(a) **Other Nations**. Along our borders with other nations, where our SRR bounds that of other nations we often get asked to assist in searches; the RCC for the bordering SRR most often will be SMC. This commonly occurs where our assets are in close proximity such as the Pacific, Great Lakes and Atlantic borders with Canada and Pacific, Gulf of Mexico borders with Mexico and multiple borders with island nations in the Caribbean and western Pacific for example. This can also happen when we have deployed resources (Coast Guard Cutters, C-130's) operating near or in other nation's SRRs.

(b) **Department of Defense.** In SAR response to DOD assets or personnel, DOD commanders may assume SMC regardless of location. In those instances Coast Guard assets may have responded independently or following a request for assistance. ***For all incidents occurring within a Coast Guard SRR, the cognizant RCC shall confer with the DOD SMC to confirm SMC assignment and coordinate CG assistance.*** The SMC for the Coast Guard may reside in these cases at the sector level when appropriate for the location, scope and type of incident.

(c) **State/Local Agencies.** Many incidents happen right along shorelines. Local officials are normally the primary responder and coordinator of response activities, by default filling the role of SMC. Incidents such as persons falling from docks, swimmers missing and vehicles driving into the water often are reported to local officials who handle the initial

response and may notify the Coast Guard only after failing to immediately resolve the incident. In many instances local agencies may report that they are in the "body recovery" or "recovery ops" mode. In these situations Coast Guard response may not be required or appropriate. Sector commands should monitor the incident and consider on a case by case basis the need for Coast Guard involvement.

(d) **Land SAR and Inland Waters**. Coast Guard assets are often requested to assist other federal, state and local agencies to respond to incidents within the inland areas; for both land and water incidents.

3.8.4.2 Actions in response to questionable suspension by other SAR authorities. There may arise cases in which the Coast Guard is involved, when the other SAR authority, according to Coast Guard standards, makes a questionable suspension decision. Under these circumstances the following actions should be taken:

(a) The involved unit(s) should first convey their concern to the other agency SMC.

(b) If the nature of the concerns is not adequately addressed by the other agency SMC, the unit should brief up their SAR chain of command to the Coast Guard SAR Coordinator (RCC).

(c) The SAR Coordinator (or representative RCC) should contact the other agency to discuss the concerns.

(d) ***If the concerns are not answered at this level, the SC shall make a decision either to proceed independently to conduct further searches or accept the decision of the other agency***.

Section 3.9
Case Documentation

Case documentation occurs both during and after an incident. During an incident, it serves to keep other involved parties informed and also to assist planning of subsequent operational effort. The SAR case file provides invaluable documentation for record purposes, determination of potential lessons learned and data for the Marine Information for Safety and Law Enforcement (MISLE).

3.9.1 SAR Case Claiming

Coast Guard units shall claim credit for situations in which resources coordinate or render assistance, regardless of position or location of the incident. The intent is to ensure Coast Guard resource activity is properly documented to support analysis of SAR operating needs, management and budgetary decisions. Accordingly, this policy should be interpreted using common sense and reasonableness. Case claiming is documented by means of MISLE discussed later in this section and more extensively in Appendix B.

3.9.1.1 Requirements for Claiming a Case. Units may claim a case whenever a response is made no matter the time or effort expended. ***However, units shall claim a case and submit MISLE data when notification of distress has been received or a Search Rescue Unit (SRU) is launched***. This applies to cases initiated by ELT/EPIRB, DSC and INMARSAT distress alerts. There is no need to claim every ELT/EPIRB case that expends less than 30 minutes of effort, as the RCCs are already required to submit an Incident History Feedback Sheet to the NOAA MCC, who enters the data into their database. For further DSC reporting requirements, see Section 2.2.2.12.

3.9.1.2 Claiming a Case When Another Agency is SMC. ***Coast Guard units carrying out SAR missions for other agency SMCs shall claim a case under the same guidance as when a CG person is SMC and required MISLE data entries shall be made as detailed in Appendix B to document the Coast Guard units participation.***

3.9.2 SAR Case Documentation and Records

3.9.2.1 Case Documentation. This may include, but is not limited to, the following examples.

(a) Logs and Diaries;

(b) SAR Forms/Checksheets;

(c) SAR Charts and Overlays;

(d) SITREPs, UMIBs, etc.; and

(e) Audio/video files.

NOTE: ***If recorded radio transmissions and telephone calls must be retained then the audio files shall include sufficient information to completely re-create the case and show the rationale for all decisions made.***

3.9.2.2 Logs and Diaries ***may be either electronic or paper documentation created and collected from start to finish of an active case and shall be entered into the MISLE system***.

3.9.2.3 SAR Forms/Checksheets. SAR Forms/Checksheets serve many purposes; documenting

information from the distressed craft; facilitating communications between responding units; briefing crews; search planning, etc. ***This data shall be entered into the MISLE system***. Some examples are listed below:

(a) **Emergency Medical Treatment Report.** ***As directed by Reference (v), the Emergency Medical Treatment Report Form (CG-5214) shall be used for all SAR cases involving injured or ill persons.*** The form provides patient clinical information for the receiving medical facility, serves as a treatment guide for administering medical care, and allows data collection and evaluation. A sample Form is in Appendix D.

(b) SAR Checksheet; and

(c) Flare Checksheets, etc.

3.9.2.4 SAR Charts and Overlays. ***At present this is electronic information and shall be attached to the proper case file within the MISLE system.***

3.9.2.5 Messages, Broadcasts, etc.

(a) **SAR Situation Reports (SITREPs)**. Passing key operational information in a timely manner, both up and down the SAR organization, is critically important to effective SAR case prosecution and documentation of completed efforts.

(1) **Internal CG Requirement.** Where MISLE data entry is complete (meets the entry standards provided in Appendix B), accurate and timely, the requirement for internal Coast Guard SITREPS may be removed by SAR Coordinators for their subordinate units.

(2) **Requirement When Working with Other Agencies.** When other U.S. (federal, state, local, volunteer, commercial, etc.) or international agencies are supporting or participating in SAR operations with the Coast Guard, and when the Coast Guard is providing resources to other national or international agencies SMCs for SAR operations, SITREPS should be provided to meet interchange of data needs.

a. This is important feedback in particular to ensure there is a clear understanding of search efforts expended, areas covered and effectiveness of searches.

b. Requiring SITREPS from others agencies when a CG member is the SMC is appropriate to aid in CG documentation of the case.

c. Providing a SITREP of CG unit support to other agency SMC should the other agency's reporting requirements. In general, use of the CG SAR SITREP format will provide all the information necessary to meet other agency needs.

(3) **Standard Coast Guard SAR SITREP format.** ***The standard format shall be used***. Other formats are not allowed except as detailed in Paragraph 3.9.2.5(a)(6); operational commanders may require additional information. Information included that may be subject to privacy, medical or other information protection should be limited to that information necessary for conduct and documentation of the response. The standard SAR SITREP format for Coast Guard use has been developed based on References (a) and (b), and the United States Message Text Format (USMTF), with consideration of field unit requirements and desires. The Coast Guard standard SAR SITREP format and an example are provided in Appendix C.

(4) **Transmission methods.** Timely dissemination of information is more critical than the method of transmission. Voice communications, followed later with written record traffic, may be substituted for initial SITREPs between the On Scene Commander (OSC) and SMC. Facsimile, e-mail and other methods that provide a retainable record are also acceptable substitutes in all cases at the discretion of the SMC. Information required does not change with transmission method and should be provided to the fullest extent possible.

(5) **Frequency of reports.** ***Frequency of SITREPs for individual SAR cases shall be set by the SMC and subject to the following conditions:***

a. The period covered will normally coincide with each search effort (efforts of each individual search plan).

b. ***The minimum frequency shall be daily***.

c. Initial SITREPs should be submitted as soon as significant information is available but should not be delayed unnecessarily for confirmation of all details. Amplifying information can be provided in subsequent reports.

These are the minimum requirements. SAR Coordinators may establish a higher frequency for operations within their search and rescue region.

(6) **SITREPs for DOD operations.** ***The USMTF format shall be used for SITREPs when the SAR operation is DOD directed or if otherwise instructed.***

(7) **Rapid reporting via Critical Incident Communications Procedures**. Specific SAR incidents may also be Critical Incidents (Incidents of National Interest as detailed in Reference (w)). When this is the situation, normal SITREP reporting procedures at the onset of the incident may not apply. ***Units shall follow the established streamlined notification system procedures to rapidly report initial, limited information about critical incidents throughout the Coast Guard and to interagency partners***.

(b) **SAR Action Plan.** ***Before a search operation takes place, the search planner shall provide a detailed search action plan to all involved facilities, specifying when, where and how individual search facilities are to conduct their search operations. Coordination instructions, communications frequency assignments, reporting requirements, and any other details required for the safe, efficient and effective conduct of the search must also be included in the search action plan***. See Section C.2 for an example of the search action plan message.

(c) **Broadcast messages** may include BNMs, UMIBs, etc. These messages should be unclassified and in plain language***. Copies of the broadcast shall be included as attachments in the case file in MISLE (attachment to the Incident Management Activity).***

3.9.2.6 Audio Files.

(a) ***Audio files consist of radio transmissions and telephone calls and shall be retained for up to 30 days***. On the Rescue 21 system all audio files are stored on the hard drive for at least 30 days. After 30 days the SAR Program does not require units to retain audio information. Note: The majority of audio information is normally recorded in checksheets

or forms within MISLE; therefore, it is not necessary to retain audio files. Audio recordings are meant to be used as an operational tool. For instance, the immediate playback of a recording may assist the operator in clarifying information from an incoming call that was garbled, distorted or misunderstood. Additionally, significant portions of audio calls may be retained for case review with the chain of command to determine the significance or determination of a case, i.e. hoax. Typically the playback of a recording(s) is done within the time span of an open case.

(b) Audio File Retention.

(1) There are circumstances where it may be desirable to retain original audio files or copied portions of audio files. They are:

a. Historically significant cases;

b. Litigation cases; and

c. Liability cases.

(2) Case Determination Responsibility.

a. Historically significant cases. ***The SAR Coordinator is responsible for determining if a case is historically significant and shall follow the guidelines in Reference (x) for submission into permanent records.*** The SC should consult with the Coast Guard Historian if there are any questions as to whether or not the case is historically significant. Historically significant cases are those cases identified as having historical significance due to the scope or nature of the cases. Examples include:

1. Cases receiving national or regional media attention;

2. Cases used in Congressional or other oversight investigations; and

3. Cases involving a great number of persons seeking rescue or involved with a large scale disaster such as a terrorist attack or natural disaster.

b. Litigation cases. The Operational Commander is responsible for determining if a case could be involved in litigation. If there is any personal injury or property damage as a result of Coast Guard involvement, the unit involved should immediately consult the Coast Guard Claims and Litigation Manual, COMDINST M5890.9 (series), Chapter 2, and its servicing legal office to determine if the audio case files need to be retained beyond 30 days as well as the requirement for retention of other specific case documentation.

c. Liability cases. The Operational Commander is responsible for determining if the Coast Guard may be liable in a case due to Coast Guard involvement. ***The Operational Commander shall consult with the legal office if there is any question as to whether or not the Coast Guard may be liable***.

3.9.3 Marine Information for Safety and Law Enforcement (MISLE) Reports

3.9.3.1 MISLE is the primary means of collecting and storing information relative to all Coast Guard

SAR operations. This information is essential in order to have a true picture of the effort expended by the Coast Guard in support of SAR operations and a clear understanding of SAR incident trends. Additionally, the MISLE database is a measurement tool for determining the Coast Guard's effectiveness in the SAR aspect of its Maritime Safety Mission. MISLE information can also be used to:

(a) Measure unit workload and effectiveness;

(b) Determine resource utilization and needs;

(c) Justify budget requests to meet projected requirements;

(d) Analyze system operations for potential improvement and savings; and

(e) Justify policies and procedures to manage the overall SAR Program more effectively.

3.9.3.2 MISLE data is entered at the unit level directly into a web-based database. Use, access and training information is provided on-line at the Operations System Center MISLE intranet site. Appendix B specifies the data collection and reporting procedures for Coast Guard units.

3.9.3.3 ***Units shall enter SAR data for every case they claim***.

3.9.4 SAR Case Studies

To improve performance at all levels of the SAR system, it is critical to thoroughly analyze significant cases and share lessons learned. Volume II of the International Aeronautical and Maritime Search and Rescue Manual provides an overview of when, why and how to conduct a SAR Case Study. Additionally, a SAR Case Study should be conducted whenever the SAR Coordinator or SMC believes there may be a benefit to the SAR System to share lessons learned and best practices.

3.9.4.1 ***Coast Guard commands with the SMC assigned shall conduct a case study when***:

(a) ***Survivors are located inside the search area after a search has been suspended;***

(b) ***Survivors are located outside the search area by someone not involved in the search while the search is in progress***; ***and***

(c) ***Directed by the Office of Search and Rescue (Commandant (CG-SAR)) or the SAR Coordinator (Area or District Commander).***

3.9.4.2 ***This paragraph shall be quoted in its entirety at the beginning of each case study (less this sentence)***. SAR Case Studies **are not** Administrative Investigations. They are intended to be used primarily as a means of contributing to the continuous improvement of the SAR system. SAR Case Studies are also valuable teaching tools that benefit current and future SAR and communications watchstanders. In order to maximize utility and value, Case Studies should consider actions that could or should have been taken, as well as those actions which, although not typically expected, may offer a benefit to the SAR system.

3.9.4.3 SAR Case Studies may be limited to addressing only certain aspects of a case that are of particular interest. For example problems with communications, use of computer search assets (SAROPS, Amver etc.) or international coordination or assistance might be singled out for examination. ***Where a SAR case involves a possible issue with a SAR system (SAROPS, EDS, Amver, etc.), that issue shall also be addressed with the appropriate authorities at the***

time the issue occurs (i.e. during the SAR case) and shall be documented via SITREP and MISLE entries.

3.9.4.4 **Survivor debriefing and equipment data.** SAR case studies provide opportunities to analyze both survivor experience and also lifesaving equipment performance. Survival in hostile environments is affected by many variables including the physical condition of the survivors, actions of the survivors, reinforcement given by rescue resources prior to rescue, and safety or survival equipment. When possible, SMCs should conduct survivor debriefs to gather all information available regarding the actual circumstances surrounding the details of the incident. See Appendix M.1.3 for further information on conducting a survivor debriefing.

3.9.4.5 More than one person should be assigned to conduct a SAR case study. Participation should be extended to the HQ program manager (Commandant (CG-SAR)), SAR School, other RCCs, and Sector Command Centers, as appropriate.

3.9.4.6 The Case Study should include, at a minimum, a consolidated case narrative, findings of fact, opinions, recommendations, and enclosures. Amplifying information regarding the format of the case study and routing of such can be found in Appendix (M) of this Addendum.

3.9.4.7 In the event other fact-finding bodies have been convened for the purpose of investigating a particular incident (i.e. AIM investigation, safety investigation, etc.) , drafters of SAR Case Studies should coordinate with those fact-finding bodies to ensure consistent findings of fact. Whenever possible, different investigative bodies should base their opinions and recommendations from the same set of facts, to avoid inconsistency of action. While different investigations have different purposes and goals, each should be able to meet its objective if the factual basis is thorough and comprehensive for all purposes.

3.9.4.8 **Forwarding of SAR Case Studies and Preparation of Final Action Report**

(a) ***The author(s) of the Case Study shall forward the study, via their chain of command, to the command entity which has authority to implement any recommended changes in policy indicated in the study.***

(b) ***A Final Action Report shall be prepared by that command following a review of the Case Study.*** The Final Action Report will be a stand-alone document, extracting any needed data from the study to justify the acceptance, implementation, or rejection of the recommendations.

(c) ***In all cases, regardless of the level of the final approving authority, SAR Case Studies (with enclosures) and Final Action Reports shall be routed via the chain of command to Commandant (CG-SAR) and the National SAR School.*** Commandant (CG-SAR) will be responsible for working with the National SAR School to extract and disseminate lessons learned and best practices

(d) Per Section 3.9.4.10, a Case Study is considered a deliberative, pre-decisional document because it has summarized facts and individual opinions which may not have been approved by the chain of command. Therefore, the majority of the Case Study is normally exempt from disclosure under FOIA. In contrast, the Final Action Report is generally not exempt from disclosure under FOIA. ***For that reason, the Final Action Report shall be drafted and treated as a standalone document, and shall not merely approve, refer to, or incorporate the underlying Case Study.***

3.9.4.9 ***Commandant (CG-SAR), the Coast Guard Operations System Center (OSC), Command, Control and Communications Engineering Center (C3CEN) and the NOAA Mission Control Center (USMCC) shall be notified immediately of any pending case studies involving Cospas-Sarsat, Amver, or SAROPS so that historical data, voyage files, environmental data, system status, etc., as appropriate, can be captured on long-term storage media and retained for later analysis.***

3.9.4.10 **Freedom of Information Act (FOIA) considerations.** In order to ensure a full and frank discussion of issues within a Case Study, it is imperative that the Coast Guard be able to protect from public release the deliberative portions of the study. Therefore, the majority of the Case Study is normally exempt from disclosure under FOIA. In contrast, the Final Action Report is generally not exempt from disclosure under FOIA. ***Any decision to waive a FOIA exemption and release an underlying Case Study to the public shall be approved by Commandant (CG-SAR).*** For additional guidance on processing requests, refer to Appendix M of this Addendum. For additional guidance on FOIA disclosure, contact your servicing legal office.

CHAPTER 4
GENERAL SAR POLICIES

Section 4.1
Maritime SAR Assistance Policy (MSAP)

This section sets forth policy and procedures for handling requests for any type of Search and Rescue (SAR) assistance from the Coast Guard and defines Coast Guard relationships with other possible sources of assistance. It establishes internal Coast Guard policy guidance only and is not intended to confer any right or benefit nor create any obligation or duty to the general public.

4.1.1 Preamble

The MSAP is the result of an effort enacted by Congress in 1982. It directed the Commandant to "review Coast Guard policies and procedures for towing and salvage of disabled vessels in order to further minimize the possibility of Coast Guard competition or interference with...commercial enterprise." The review was directed because of congressional concern that Coast Guard resources were being used unnecessarily to provide non-emergency assistance to disabled vessels that could be adequately performed by the private sector.

The MSAP represents more than a decade of development of relationships among the Coast Guard, Congress, the commercial towing industry, and the Coast Guard Auxiliary. Each iterative revision of the MSAP has received close scrutiny. It has been a give-and-take process culminating in a policy that is equitable to all stakeholders.

Problems have often arisen when individuals or groups have interpreted the MSAP to fit their own particular situation or personal agenda. This contradicts the aim of the policy and creates unnecessary conflict amongst those for whom it was intended to serve. The key is to follow the policy as it is intended, to seek clarification where necessary, and to collectively ensure that the disabled and/or endangered mariner gets fair, reasonable, and consistent service throughout the United States. However, in order to clarify some of the more often misinterpreted aspects of the MSAP, notes have been added.

4.1.2 Definitions

4.1.2.1 Coast Guard Resources: Includes active duty personnel; reserve personnel when serving under any form of active or inactive duty orders; auxiliary personnel when serving under orders; cutters; boats; aircraft; and equipment of active duty, reserve, and auxiliary Coast Guard units.

4.1.2.2 Emergency Phase: Classification made by the SAR Mission Coordinator (SMC) upon receiving a request for assistance. The three emergency phases; i.e., UNCERTAINTY, ALERT, and DISTRESS, are described in Reference (a). A shortened definition of each is:

(a) An UNCERTAINTY phase exists when there is knowledge of a situation that may need to be monitored, or to have more information gathered, but that does not require moving resources.

(b) An ALERT phase exists when a craft or person is experiencing some difficulty and may need assistance, but is not in immediate danger or in need of immediate response. Apprehension is usually associated with the ALERT phase.

(c) The DISTRESS phase exists when grave or imminent danger requiring immediate response to the distress scene threatens a craft or person.

4.1.2.3 On Scene: When the assisting resource has completed any necessary transit to the vessel requiring assistance.

4.1.2.4 Safe Haven: A Safe Haven is considered a place that can accommodate and will accept the safe mooring of the vessel.

4.1.3 Background

4.1.3.1 Coast Guard Mission. The Coast Guard promotes safety on, over, and under the high seas and navigable waters subject to the jurisdiction of the United States. The Coast Guard is authorized by law to develop, establish, maintain, and operate search and rescue facilities. The Coast Guard is authorized to perform any and all acts necessary to rescue and aid persons; and to protect and save property at any time and at any place where its facilities and personnel are available and can be effectively used. However, there is no legal obligation for the Coast Guard to undertake any particular rescue mission.

4.1.3.2 Coast Guard Auxiliary Mission. The Coast Guard Auxiliary is a volunteer, non-military organization of civilians under the direction and administration of the Coast Guard. The functions of the Auxiliary include promoting safety and effecting rescues on the high seas and U.S. navigable waters. Auxiliary operational facilities are excellent resources that can, within their capabilities, enhance the Coast Guard's ability to respond to maritime emergencies. The Auxiliary has a proud tradition of support to the Coast Guard and help to mariners who need assistance on the water.

4.1.3.3 Other Assistance Available. The Coast Guard has often been the only source of readily available assistance to recreational boaters. However, commercial and additional volunteer sources of assistance exist and are capable and willing to provide various services to mariners. Additionally, other federal agencies and many state, county, and local governments have resources which may be capable and willing to assist the Coast Guard or otherwise provide assistance to mariners.

4.1.3.4 Commercial Operator's License Required. 46 U.S.C. § 8904 requires the operator of any vessel that tows a disabled vessel for compensation to have a valid license to operate that type of vessel in that particular geographic area.

4.1.4 Discussion

4.1.4.1 Prevention. The Coast Guard emphasizes that the best deterrent to needing assistance is a prepared and knowledgeable mariner. Before departing, the prepared operator ensures that all safety equipment, sufficient fuel, and necessary charts are onboard; the vessel is in good operating condition; the radio is operating properly; and someone knows the sailing plan of the operator, and will notify the Coast Guard if the vessel fails to return when expected.

4.1.4.2 Primary Concern. The Coast Guard's primary concern in a search and rescue situation is to provide timely and effective assistance.

4.1.4.3 Responsibility for Action. In search and rescue, the SMC is usually in the best position to assess the circumstances of a particular case, and to take whatever steps are necessary to promote the safety of life and property.

4.1.4.4 Safety Concerns When Disabled. Inherent danger is associated with being disabled on the water. Although a specific situation may not be classified as DISTRESS emergency phase by the SMC, there may still be a real concern for safety either in the mind of the SMC or the mariner, i.e., the incident is in the ALERT emergency phase. ***The SMC must be sensitive to the level of apprehension caused in the mind of the mariner when having a problem in a small recreational vessel, particularly when concern is specifically expressed***. The policy herein permits more expeditious response in those cases where the mariner expresses apprehension for the near-term safety of vessel's occupants.

4.1.5 Policy

4.1.5.1 Distress. ***Immediate response shall be initiated, if feasible, to any known situation in which the mariner is in imminent danger.*** This response may be provided by regular Coast Guard; Coast Guard Auxiliary; or other federal, private, state, local, or commercial entity resources. The SMC may use all sources of assistance in a distress situation without concern for conflict with private enterprise.

4.1.5.2 No Conflict Concern--Any Situation. Private organizations (non-commercial), state and local organizations, and Good Samaritans are acceptable sources of SAR assistance. When volunteered or available, their help can be used without any concern for conflict with commercial providers. ***However, if their expertise is unknown, the SMC shall more closely monitor the assistance provided.*** This is especially true in the case of Good Samaritans.

4.1.5.3 Guiding Principles in Non-Distress Cases. When specifically requested assistance, such as a commercial firm, marina, or friend, is not available, a request for assistance will be broadcasted. If a commercial provider is available and can be on scene within a reasonable time (usually one hour or less) or an offer to assist is made by a responder listed in the previous paragraph, no further action by the Coast Guard, beyond monitoring the incident, will be taken. Otherwise, a Coast Guard Auxiliary facility, if available, or a Coast Guard resource may be used.

NOTE: "Monitoring" of a non-distress incident need not necessarily constitute a radio communications schedule.

Three principles that guide assistance to vessels not in distress are:

(a) The first responder on scene with the vessel requesting assistance normally will provide assistance,

(b) If a Coast Guard resource or Auxiliary facility takes a disabled vessel in tow, the tow will normally terminate at the nearest safe haven, and

(c) Once undertaken, there is no requirement to break the tow except as described below in Paragraph 4.1.6.6, "Relief of Tow".

NOTE: General procedures and instructions for towing are contained in the Boat Crew Seamanship Manual, COMDTINST M16114.4 (series) (Reference (g)).

4.1.5.4 Non-Distress Use of Coast Guard. The Coast Guard supports and encourages efforts of private enterprise and volunteerism to assist mariners. Coast Guard resources will not unnecessarily interfere with private enterprise. Coast Guard resources normally do not provide immediate assistance in non-distress cases **if alternative assistance is available.** A Coast Guard resource may assist in a non-distress situation when no higher priority missions exist and no other capable resource is reasonably available.

NOTE: "Reasonably available" means that the resources should be able to respond before the situation deteriorates.

4.1.5.5 Acceptable Auxiliary Employment. When on routine safety patrol under orders, Auxiliary operational facilities may be deployed to minimize response time to requests for assistance. ***Every effort shall be made to provide maximum SAR coverage in the assigned area of responsibility by using all available resources effectively***. Auxiliary facilities may also be available for callout when not on routine patrol. Auxiliary facilities will be used to the extent of their capabilities and availability.

4.1.5.6 Inspection of Alternate Resources Not Required. There is no requirement for the operational commander to inspect, certify, or otherwise categorize the capabilities of commercial providers or any organization that responds to requests for assistance by mariners. Accepting or rejecting an offer of assistance is a function of the vessel operator. However, the operational commander should be familiar with the availability, capabilities, and operating practices of these alternate assistance providers, as they may form a significant element in the overall assistance network.

4.1.5.7 Conflict of Interest for Coast Guard and Auxiliary Personnel. Because of the possibility of conflict of interest, active duty Coast Guard personnel, Reservists under active duty or inactive duty orders, and Auxiliarists under orders are prohibited from engaging in commercial assistance activity of any sort. Likewise, Reserve and Auxiliary personnel are not to be used in any capacity that might give rise to the perception of a conflict of interest. ***Vessels and aircraft used for commercial assistance activities shall not be accepted as an Auxiliary facility. A designated Auxiliary operational facility shall not be used as part of commercial assistance activities at any time.***

NOTE: An Auxiliary facility remains so designated even when not under orders as long as the person(s) is/are a member of the Auxiliary.

4.1.5.8 Assistance to Auxiliary Facilities. Coast Guard resources or Auxiliary facilities may be used to help Auxiliary facilities in need of assistance at any time.

4.1.5.9 Use of Government Frequencies. Government frequencies are reserved for authorized use by government agencies. ***Commercial enterprise must use designated commercial frequencies. Commercial enterprise shall NOT interfere with the Coast Guard's gathering of information or communicating with a vessel requesting assistance***. They may, upon hearing of a request for assistance on a government channel, hail the vessel desiring assistance on an authorized calling frequency and switch them to a commercial channel to conduct business when Coast Guard communications are completed. They may also proceed to the location of the vessel requesting assistance, based on information overheard on the government channels. ***As net control, the Coast Guard MAY permit nongovernmental entities to conduct short business transactions on a government channel on a not-to-interfere basis, but any unit so doing must continue to monitor the communications***.

NOTE: There is no requirement that the commercial channel be a frequency normally monitored by the Coast Guard.

4.1.6 Procedures

4.1.6.1 Obtain Information and Classify Case. ***When the Coast Guard receives a call for assistance, the SMC shall evaluate the circumstances to determine the severity of the case using information obtained from the mariner***. It is the **initial** determination that will govern how a case is to be initially treated. Later developments may cause the SMC to reclassify the case and modify the response. If there is any question as to the degree of danger to persons or property, the case should be classified as being in the DISTRESS phase. ***A SAR event is dynamic. Information must be obtained and evaluated as the case progresses. The SMC shall take action appropriate to the situation.*** In determining the appropriate emergency phase, the SMC may consider a variety of factors, such as, but not limited to, the following:

(a) Nature of the situation;

(b) Position or lack of known location;

(c) Type, size, reported condition of vessel, food, water, emergency signaling devices, and survival/life saving equipment onboard;

(d) Visibility, including daylight or darkness conditions;

NOTE: A lack of visibility, in-and-of-itself, does not necessarily constitute a distress situation. ***Other factors, such as equipment limitations, proximity to shipping lanes, etc., must be considered prior to case classification***.

(e) Tide and current conditions, and the ability of the vessel to anchor;

(f) Present and forecasted weather including wind and sea conditions, air and sea temperature;

(g) Special considerations such as number of personnel onboard, age, health, and special medical problems;

NOTE: "Special medical problem" requires use of common sense, e.g. an otherwise healthy person, who simply has a limb in a cast, does not necessarily constitute a special medical problem.

(h) Ability of the vessel to maintain reliable communications with a source of assistance. CB radio communications should be considered only under ideal conditions. They are not authorized on Coast Guard vessels for communication and Coast Guard shore units have no requirement to have CB capability;

NOTE: Another on scene vessel can act as the communications platform for a disabled boater. Although the Coast Guard discourages boaters from using cellular telephones for emergency purposes, they ***may*** be considered a reliable form of communication. If the cellular telephone connection is good, and there is no danger of losing the connection, then, in the absence of any other factors listed that would raise SMC's level of apprehension, the case should be classified as non-distress and treated as such. In such cases, the Command Center should act as a communications intermediary and should closely monitor the case to ensure the disabled boater does, in fact, receive the assistance required. It is acceptable for the SMC to dispatch a resource while broadcasting a MARB, but it is the intent of the policy to allow commercial providers the opportunity to respond.

(i) Degree of concern of the mariner for the safety of the occupants of the vessel - ask the questions, "Do you have safety concerns?" and if so, "What are they?"; and

(j) The potential for the situation to deteriorate after evaluating the relevant factors,.

4.1.6.2 Distress. For cases determined to be in the DISTRESS emergency phase:

(a) **Respond Immediately If Able.** Immediate response may be by either Coast Guard or Coast Guard Auxiliary resources. The SMC might be aware that other resources, such as private, local/state-operated vessels, or commercial providers, might be responding. That fact, however, normally should not delay or preclude a Coast Guard response. If Coast Guard resources cannot or are not responding, the caller should be notified.

NOTE: ***As mentioned in 4.1.6.1, if a case is classified as distress, the Coast Guard shall respond immediately if able, to include broadcasting a UMIB and dispatching appropriate resources***.

(b) **First On Scene Assists.** The first assisting resource on scene capable of stabilizing and handling the situation, whether Coast Guard or other resource, should render appropriate assistance and complete the case if it desires. If a Coast Guard resource arrives on scene and another responder has the situation under control, the SMC should determine whether or not the other responder is able to fully execute the case. If it appears that it can, the Coast Guard resource may be withdrawn.

NOTES: If a Coast Guard resource arrives on scene first in a distress situation and renders the situation non-distress, it may elect to complete the case, i.e., it may tow the disabled boat to the nearest safe haven if there is no higher need for the resource.

(c) **Intervene If Required.** If a Coast Guard resource finds another responder on scene whose assistance is not adequate, the Coast Guard resource should immediately attempt to stabilize the emergency. Once the situation is stabilized, the Coast Guard resource may be withdrawn if the first responder appears capable and is willing to conclude the case. The Coast Guard resource should not normally be withdrawn if continued stability of the situation is dependent on Coast Guard equipment or expertise.

NOTE: The Coast Guard may direct a responding resource to drop tow or cease operations if it is determined that the resource or equipment is not adequate to perform the job at hand, e.g., a 23' boat cannot be expected to adequately tow a 70 ton fishing vessel.

(d) **Treat As Non-Distress If Appropriate.** If the Coast Guard responds to a request for assistance and, once on scene, determines that there is no emergency, the case will be handled as a non-distress, following the procedures outlined below.

4.1.6.3 Non-Distress. For cases determined NOT to be in the DISTRESS emergency phase:

(a) **Advise and Seek Desires.** The requester should be advised that:

(1) It appears there is no imminent danger;

(2) It is Coast Guard policy to defer to an alternate responder; and

(3) The Coast Guard will assist in contacting any specifically requested alternate assistance, such as a commercial provider or friend.

NOTE: The issue of what constitutes a "specific request for alternate assistance" has led to confusion. Clearly, if a requester names a specific individual, company, or network, that is a specific request. In the case of generic requests for a specific network organization, contact general dispatch at the parent organization. However, if the mariner is unable to clearly articulate the name of the desired source of assistance, the SMC should ask for clarification. If unable to get clarification, a MARB should be issued.

(b) **Offer a Marine Assistance Request Broadcast (MARB).** When specific alternate assistance is not requested or available, mariners will be informed that a broadcast can be made to determine if someone in the area can come to their assistance.

(1) If the mariner requesting assistance states that a MARB is not desired or specifically requests that a Coast Guard resource or an Auxiliary facility be dispatched, outline the policy again. ***Notify the mariner that unless a specific request is made for alternate assistance, the mariner must accept either the alternative of letting the Coast Guard make a MARB, or the mariner can arrange for assistance***.

(2) If a MARB is declined, the SMC may monitor the condition, but need take no further action unless requested or the situation deteriorates.

NOTE: If MARBs are declined in a non-distress situation, the Coast Guard has no further obligation to monitor or respond unless boaters change their mind or the situation deteriorates. The burden lies solely with boaters.

(3) When a MARB is requested, proceed as described below.

(c) **Make a MARB.** A MARB will be made to solicit the voluntary response of anyone who can assist the mariner, and the MARB will include a general location of the vessel. (See sample MARB at the end of this section). ***The MARB must be worded carefully in order not to create an obligation by the vessel operator to accept or pay for the services of any and all responders***. It is used to invite persons, such as commercial providers or Good Samaritans, interested in responding to do so **if they desire.** If no intent to respond to the MARB is heard within a reasonable period of time, Coast Guard resources or Auxiliary vessels may be directed to respond. A guideline of 10 minutes is recommended for the SMC to await an answer to a MARB before the SMC directs Coast Guard or Auxiliary resources to respond. Once the MARB is answered, the SMC will determine what a reasonable period of time is for a response time on scene, based on the SMC's experience with responders in the area and the circumstances of the case. Coast Guard resources or Auxiliary vessels may also be directed to respond if no alternate responder can do so within a reasonable period of elapsed time. Factors governing the elapse of a reasonable period of time for assistance to arrive on scene are discussed below, but such a period should not normally exceed one hour from first awareness of the case.

(d) **Monitor Response.** As part of the MARB, any resource that is responding should be requested to notify the Coast Guard of the estimated time of arrival (ETA) on scene. This notifies the Coast Guard of the responder's actions. It also notifies the vessel requesting assistance of the ETA of the assisting resource. Moreover, it notifies other potential responders of the need for further assistance or whether they should proceed with any expectation that they will arrive on scene first. The SMC may repeat the identity and ETA of potential responders so that the mariner requesting assistance and others will know who has responded.

NOTE: Although it is encouraged that the MARB include Coast Guard notification of ETAs, it is not mandated. Neither is it mandated that the SMC repeat the identity and ETA of responders. It is, however, advised.

(e) **Maintain Communications.** A communications schedule between the Coast Guard and the requestor should be established until direct communication is achieved between the requester and responder to ensure that the situation does not deteriorate and that assistance has arrived.

(f) **Reasonable Time Determination.** Following the initial MARB, the SMC may wait a reasonable period of time before taking further action, during which additional MARBs may be made if desired by the SMC**.** ***The "reasonable period of time" decision must be made by the SMC based upon the information collected at the outset of the***

communication with the mariner requesting assistance (see listing in Paragraph 4.B.6.a. above), as updated by subsequent communications checks. Loss of or lack of effective direct communications may increase the level of apprehension. The definition of the ALERT emergency phase is again referred to, with its key word "apprehension." It should be considered that the situation may be causing apprehension in the mind of the mariner, especially if the mariner so indicates. Any action to alleviate that stress may be instrumental in preventing the situation from deteriorating. The greater the level of apprehension, the shorter the "reasonable period of time."

(g) **Simultaneous Arrival.** ***To minimize conflict, if an Auxiliary facility under orders or a Coast Guard resource arrives on scene nearly simultaneously with a commercial provider, it shall report to the SMC, remain on scene until it is confirmed the provider is capable of providing the required assistance and safely completing the case, then clear the area, and take no further part in the incident***.

(h) **Mariner May Decline Offered Assistance.** To a limited extent, the mariner requesting assistance has the option to refuse offered assistance. If the requester refuses offers of assistance from a Good Samaritan or an Auxiliarist, another MARB may be issued or the SMC may decide to intervene and dispatch a different Auxiliary facility or a Coast Guard resource. The mariner may also elect to contact a commercial provider on a commercial channel.

(i) **Commercial Assistance Declined.** A more difficult situation may arise if the mariner requesting assistance rejects the first arriving commercial assistance. Coast Guard Auxiliary or Coast Guard units should not assist in these cases so long as the situation remains classified below the DISTRESS phase. Nevertheless, the mariner may be assisted in finding alternatives. Upon notification that the mariner does not desire the assistance offered by the commercial provider, the Coast Guard may, upon the mariner's request, broadcast one additional MARB. The Coast Guard may also provide the telephone numbers of other commercial providers in the area so that the mariner can call them through the Marine Operator. If this is successful, it is the responsibility of the mariner, not the Coast Guard, to negotiate who provides the service. ***If unsuccessful, and so long as the original commercial provider is on scene, the SMC may maintain a listening watch for the vessel, but must make it clear that neither Coast Guard nor Auxiliary units will be dispatched***. Should the commercial provider abandon the case, the SMC may dispatch a Coast Guard or Auxiliary unit or issue an additional MARB, as appropriate. The principle that governs further action by the SMC is that once a responder has arrived on scene, the level of apprehension regarding the case is probably significantly reduced. Further dealings between the requester and the responder are not Coast Guard responsibility. Additional services provided to the mariner requesting assistance would be provided only on a not-to-interfere basis so long as the level of apprehension remains low.

(j) **If Situation Deteriorates.** The SMC should normally dispatch Coast Guard resources at any time the circumstances in a case threaten to deteriorate into a DISTRESS situation that exceeds the capability of the assisting resource.

4.1.6.4 Cases Discovered By Auxiliary Facility. When an Auxiliary vessel on routine safety patrol or otherwise on orders discovers a vessel requesting assistance, but not in radio contact with the Coast Guard, the Auxiliarist will relay the request for assistance to the Coast Guard

operational commander and may undertake to provide assistance, if capable. If a tow is undertaken, the Auxiliary vessel is required to notify the operational commander of the identity of the vessel, the location of the vessel, and the destination to which the vessel is being towed. No Auxiliary vessel may undertake the tow of another vessel unless the Auxiliarist is reasonably assured of the safety of both vessels and the persons onboard. If the Auxiliary vessel cannot safely tow a disabled vessel that is standing into danger, it may endeavor to remove the persons from the threatened vessel and stand by until a more capable resource arrives on scene.

NOTE: Cases discovered by the Auxiliary are a particularly sensitive section of the policy. How the situation is dealt with is the end product of sustained negotiations and compromise effort on the part of all concerned parties. It intends that the Auxiliarist, not the SMC, will make the judgment as to whether the Auxiliarist can safely assist. When Auxiliarists notify the SMC that they intend to assist the vessel, they are not "asking for permission". They have already determined they can safely provide assistance. The notification to the SMC is a courtesy. This policy does not reduce the operational commander's authority and responsibility to exercise command and control over all assigned forces, including Auxiliary vessels on ordered patrols. The operational commander may override the Auxiliarist's decision if warranted by an evaluation of the circumstances. However, unless there is a specific reason to do so, such as an indication of unusual risk or hazard, or an operational need to assign the Auxiliary vessel to a higher priority mission, the decision to assist should be left to the Auxiliarist.

4.1.6.5 Safe Haven Considerations. In cases involving towing by the Coast Guard or Coast Guard Auxiliary, the vessel being assisted will normally be taken to the **nearest** safe haven that has an available means of communication, normally a telephone. Coast Guard or Auxiliary resources should not tow the vessel beyond the nearest safe haven when there are commercial resources that could perform this function. Exceptions to this policy may be made in specific cases if, in the judgment of the SMC, they are warranted by humanitarian or other concerns. When determining the suitability of a potential safe haven, the SMC should be sensitive to the reluctance of some private firms and yacht clubs to accept a disabled or damaged vessel and the attendant potential liability.

4.1.6.6 Relief of Tow. In cases involving towing by the Coast Guard or Coast Guard Auxiliary where no emergency exists, the assisted vessel **may** be released to another provider who appears capable, provided that:

(a) The SMC and coxswain of the assisting vessel determine that a hand-off can be carried out safely; and either

(b) Alternative assistance is desired and arranged by the operator of the vessel being assisted; or

(c) The operational commander has a higher need for the Coast Guard resource or Auxiliary facility.

4.1.6.7 Alternative to MARB. When no response to a MARB is evident, such as late at night or during an off-peak period, the SMC may dispatch Coast Guard resources or Auxiliary vessels. As an alternative, the SMC may pursue by telephone or other communication means any other SAR resource that can provide expeditious response, and ask if the resource desires to respond. Again, unless the responder is an Auxiliary facility that will be under orders, the offer should be made in terms of an invitation to provide assistance rather than in terms of "request you proceed and assist." An estimated time of arrival should be obtained and passed to the mariner requesting assistance. Continue to monitor the situation. Direct contact with the vessel requesting assistance as soon as possible should be encouraged.

4.1.6.8 Communications Interference. If someone interferes with government communications, issue the command "SEELONCE MAYDAY." If interference continues, then follow with "SEELONCE MAYDAY, this is (unit name), cease transmission or silence on this frequency, out." If there is still further transmissions then document the incident and process as an FCC violation. For further details regarding how to initiate a violation, refer to title, Radio Frequency Plan, COMDTINST M2400.1 (series) (Reference (q)).

4.1.7 SAR Coordinator and SMC Responsibilities

4.1.7.1 Responsibilities

(a) ***SAR Coordinators shall direct SMCs within their region to follow the policy and procedures established in this section of the Coast Guard Addendum to the National SAR Plan insofar as practicable***. SAR Coordinators are authorized to vary procedures where local conditions require it in order to achieve the overall intent discussed. Variances should be documented.

(b) ***SMCs must remain familiar with all SAR assistance resources within the SMC's unit's AOR, including those of the Auxiliary, and shall direct those resources that the SMC believes are needed to the scene of a vessel in distress.***

(c) Operational commanders are urged to work with all who can provide assistance to mariners requesting assistance, including volunteers, state and local organizations, the Auxiliary, and commercial providers, to promote the most effective use of all resources available to the SAR system.

(d) ***Sector commands shall conduct regional public meetings with commercial assistance providers in their AOR no less than semi-annually, preferably prior to and at the conclusion of the local recreational boating season.***

(1) ***At a minimum, one of the semi-annual meetings shall be held collectively for the Sector's entire AOR***. Alternatively, one meeting may be held at each of the Sector's stations for commercial assistance providers within each station's AOR in lieu of the second collective semi-annual meeting.

(2) Sector Commanders and Deputies should attend the meetings when possible. ***At a minimum the Sector Chief of Response and the Command Center Chief shall attend each collective meeting***.

(3) ***At a minimum either the Sector Chief of Response or the Command Center Chief shall attend each station level meeting if held in lieu of one of the semi-annual Sector meetings***.

(4) If meetings at the station AOR level are held in addition to the semi-annual meetings, a Sector representative should be invited to attend. Attendance is recommended but not mandatory.

(5) ***In addition to the commercial assistance providers, local agency responders from fire/rescue, law enforcement, CG Auxiliary and other members of the maritime response community shall be invited to participate in the meetings.***

(6) Meetings should cover the full range of maritime response topics of interest to the attendees, including at a minimum the following topics:

a. Review of CG operational response policies and procedures, and any changes;

b. Review of each invited participant's (commercial, local, volunteer, etc.) response capabilities and operational areas;

c. Review and discussion of several relevant cases involving multiple segments of the response community; and,

d. Open forum discussion.

(e) Sectors and Stations will also maintain regular liaison with all known commercial assistance providers in their AOR in order to discuss policies, build cooperation, and air any Coast Guard or industry concerns. Within each command a specific person should be designated as liaison officer and primary point of contact for commercial assistance providers.

(f) It is highly recommended that commercial providers be invited to participate in training and exercises held with other (state, local, volunteer organization) SAR assistance providers.

4.1.7.2 Maritime Assistance Decision Flow Chart. The Maritime Assistance Decision Flow Chart, Figure 4-1, is provided to assist the SMC on MSAP decision-making. The flow chart is a tool to implement the policy, not the policy itself.

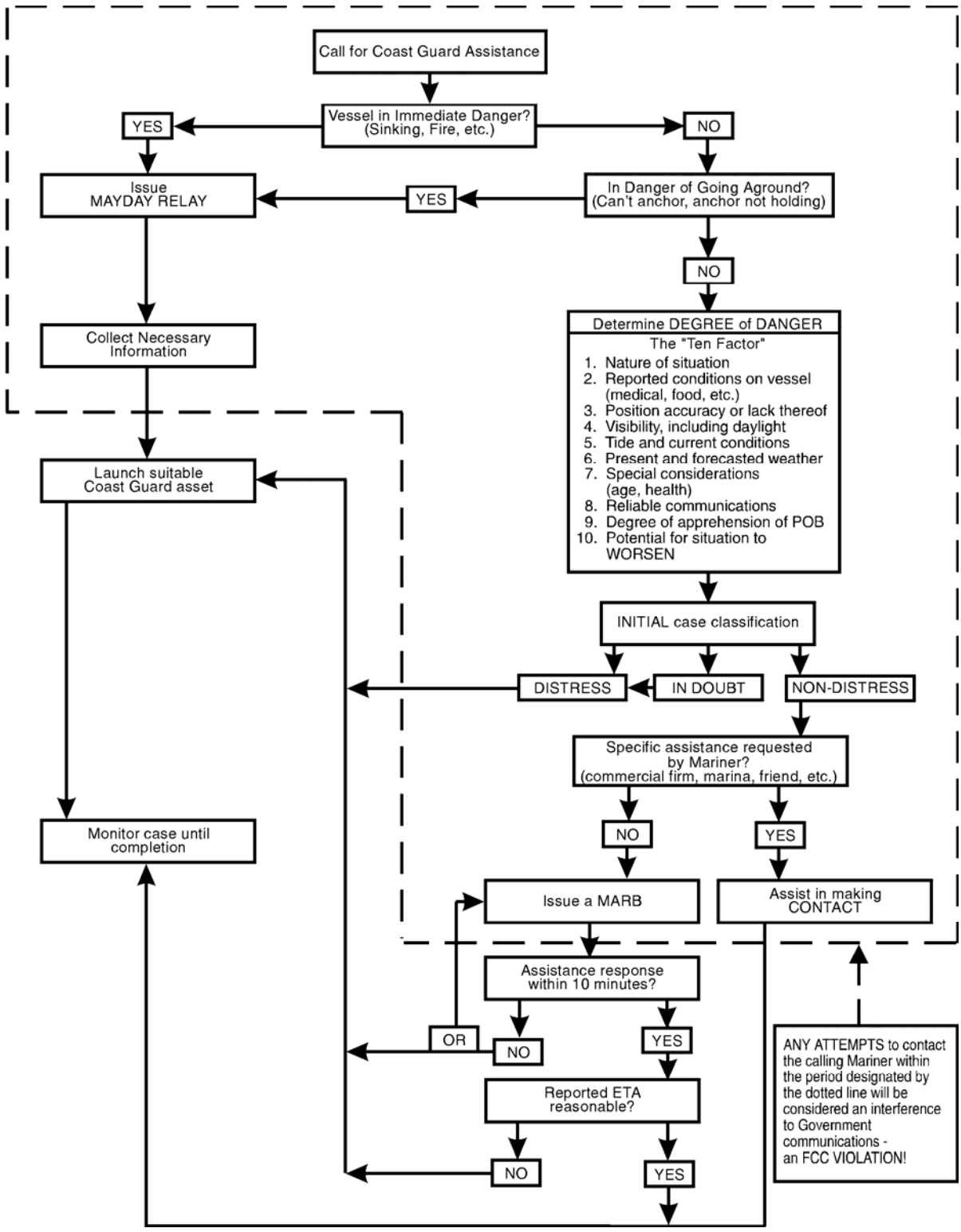

Figure 4-1 USCG SAR Mission Coordinator (SMC) Maritime Assistance Decision Flow Chart

4.1.8 Marine Assistance Request Broadcast Format for Radiotelephone Transmission

4.1.8.1 Format

(a) Channel 16 (156.8MHz)

(b) HELLO ALL STATIONS (3 times) THIS IS (unit identification) RELAYING A MARINE ASSISTANCE REQUEST BROADCAST FOR (type of vessel) (nature of problem) IN THE VICINITY OF (location). LISTEN CHANNEL 22A, OUT.

(c) Channel 22A (157.1MHz)

(d) HELLO ALL STATIONS (3 times) THIS IS (unit identification) RELAYING A MARINE ASSISTANCE REQUEST BROADCAST (text) OUT.

4.1.8.2 Example of Text

(a) Channel 16 (156.8MHz)

HELLO ALL STATIONS. HELLO ALL STATIONS. HELLO ALL STATIONS. THIS IS COAST GUARD SECTOR HAMPTON ROADS RELAYING A MARINE ASSISTANCE REQUEST BROADCAST FOR A DISABLED PLEASURE CRAFT IN THE VICINITY OF THE FOURTH ISLAND OF THE CHESAPEAKE BAY BRIDGE TUNNEL, LISTEN CHANNEL 22A, OUT.

(b) Channel 22A (157.1MHz)

HELLO ALL STATIONS. HELLO ALL STATIONS. HELLO ALL STATIONS. THIS IS COAST GUARD SECTOR HAMPTON ROADS RELAYING A MARINE ASSISTANCE REQUEST BROADCAST FOR PLEASURE CRAFT MOONSHINE WYT5138. PLEASURE CRAFT MOONSHINE IS A SEVENTEEN-FOOT FIBERGLASS OUTBOARD DISABLED DUE TO LACK OF FUEL IN VICINITY OF THE FOURTH ISLAND OF THE CHESAPEAKE BAY BRIDGE TUNNEL LATITUDE 37-03N LONGITUDE 76-04W. ANY VESSEL DESIRING TO ASSIST THE MOONSHINE IS INVITED TO PROCEED TO THAT LOCATION OR CONTACT HIM BY RADIO. PLEASURE CRAFT MOONSHINE IS STANDING BY CHANNEL (an appropriate intership frequency). IF YOU ARE OFFERING TO ASSIST THE MOONSHINE, PLEASE RESPOND AND PROVIDE AN ESTIMATED TIME OF ARRIVAL. OUT.

(c) Channel 22A (optional acknowledgment of replies)

VESSEL SEA DOG RESPONDING, ETA 15 MINUTES--ROGER, OUT. VESSEL HELPER RESPONDING, ETA 35 MINUTES--ROGER, OUT.

Section 4.2
Forcible Evacuation of Vessels

4.2.1 Authority

The Coast Guard is authorized to rescue and aid persons and protect and save property at any time and any place where its facilities and personnel are available and can be effectively used. This may include forcing or compelling mariners to abandon their vessels when a life-threatening emergency exists, and there is an immediate need for assistance or aid.

4.2.2 Voluntary Evacuation a Preferred Alternative

Although the Coast Guard does have the authority to compel a mariner to abandon their vessel in a life threatening situation, it is always preferable that a mariner voluntarily evacuate when necessary. Coast Guard personnel should endeavor to use all means, including powers of persuasion, to encourage a mariner to evacuate, when appropriate. Forcible and/or compelled evacuations should only be conducted when a life-threatening emergency exists, and there is an immediate need for assistance or aid.

4.2.3 Risk Considerations

The decision to order a compelled or forcible evacuation for the purpose of saving lives will be based on the myriad of factors that combine to make each SAR mission unique. Therefore, when considering whether or not to take this action, the factors that are considered in Operational Risk Management for SAR planning should serve as a model for evaluating the risk to the civilian mariner and the necessity for ordering such a compelled evacuation. These factors include the on scene environmental conditions, the presence of a hazardous bar, shoals or other hazardous obstruction, the condition of the mariner's vessel, available Coast Guard resources, the fitness and experience of the Coast Guard personnel on scene and the expertise of the authority ordering the evacuation.

4.2.4 Decision Authority

The decision to force or compel mariners to abandon their vessels should normally be made by the cognizant SAR Coordinator (SC). If time does not permit consultation with the SMC and cognizant SC, and if in the On Scene Coordinator's (OSC) objective judgment a life-threatening emergency exists affecting the subject vessel, and there is an immediate need for assistance or aid, the OSC may authorize this action. ***In this case, the SMC and SC shall be notified immediately.***

4.2.5 Use of Force Considerations

Properly trained, qualified, and supervised Coast Guard law enforcement personnel may use force in accordance with the Coast Guard Use of Force policy found in Reference (o), when necessary, to compel compliance with an evacuation order issued under the aforementioned

conditions.

4.2.6 Distressed Vessel Master's Authority Limitation in Regards to Crew Evacuation

Once the Coast Guard issues an evacuation order, masters of vessels have no authority to prevent their crews from complying with evacuation instructions. Any use or attempted use of force by the master to prevent a crew from complying with evacuation instructions may constitute a criminal offense.

4.2.7 Documentation

All forced evacuations and circumstances leading to such an order shall be fully documented in unit logs by all involved units and reported in Situation Reports to Commandant (CG-SAR-1) and Commandant (CG-0941) via the chain of command. Use of force required to compel compliance with an ordered evacuation shall be reported in accordance with Appendix E of Reference (o). The responsible Flag Officer shall consult his or her servicing legal office regarding the need to initiate a claims investigation, and, where appropriate, an administrative investigation in all forcible evacuation cases.

Section 4.5
Direction and Navigation Assistance to Mariners

4.5.1 General

The responsibility for the safety and navigation of a vessel rests with the vessel's operator, not the Coast Guard. Units may pass any printed information, including navigational in nature that comes from a recognized source. This includes any information from current/updated NOAA or NIMA nautical charts, Local Notice to Mariners, Light Lists Coast Pilot, etc. In all situations, the standard to follow is to make sure any information passed is prudent, based on fact, and never based on opinion or conjecture. ***The Coast Guard shall not provide courses to steer except as permitted in Note to 4.5.2.4 below***. Additionally, any information passed to a mariner requesting assistance should be reflected in the appropriate communications log. Regardless, passing information should not interfere with more urgent operations**. *If there is any doubt for the safety of the individuals requesting assistance, this shall be treated as a SAR case and an appropriate response developed***.

4.5.1.1 Stated current standard navigational information that may be passed includes:

(a) Characteristics of lights;

(b) Magnetic or true bearings between charted objects;

(c) Charted range bearings;

(d) Charted traffic separation scheme bearings;

(e) Charted depth of water;

(f) Charted hazards;

(g) Radio beacon frequencies;

(h) Charted buoy positions;

(i) Lat/Long of charted objects.

If information is provided, the following language is recommended:

"Captain, based on your request, the following information from (chart #, light list #, NTM, etc.) is provided to assist you with your responsibility to safely navigate your vessel." Pass relevant information from the list above.

NOTE: The Coast Guard will not assume responsibility for navigating a vessel, but it may provide the master of a vessel certain navigation information if available as charted or published by a reputable source. In the field there is a perception that passing navigational information to mariners is discouraged because of the potential for liability. However, certain types of navigational information may be passed if it is accurate and reliable. Another consideration is that, while a mariner may only be requesting information and has not declared a distress, the vessel situation may dictate a more active involvement by the SMC as a precautionary measure.

4.5.2 Lost/Disoriented Mariner

Most requests for navigational information come from lost or disoriented mariners.

4.5.2.1 When contacted by a lost or disoriented mariner, the watchstander should ask the mariner questions regarding:

(a) Any nearby landmarks;

(b) Aids to navigation;

(c) Presence of commercial traffic (i.e., ferries, harbor tour boats, merchant vessels, etc.);

(d) Depth and color of water;

(e) Point of departure and destination;

(f) Description of vessel's trackline from departure to present, etc.

4.5.2.2 If the Sector Command Center is equipped with direction finding (DF) equipment, it may also be used within its stated accuracy, and if the DF fix or bearing is deemed reliable, to determine or verify the approximate position.

4.5.2.3 If the mariner's approximate position can be ascertained, the following response is appropriate:

"Based on the information you have provided (and/or the approximate position determined by our direction finding equipment), your vessel appears to be located in the vicinity of _____. Please be advised that this is an approximate position and should be used with other navigational information to assist you with your responsibility of safely navigating your vessel. We strongly recommend you study the chart for that area or consult with a passing vessel before proceeding further."

4.5.2.4 Passing courses to Steer. ***Watchstanders shall not pass courses to steer***. However, in situations involving navigational safety, bearings between charted objects may be provided from a corrected chart in either degrees true or magnetic, provided you can determine the boater's position with reasonable certainty. Units should exercise caution because there are numerous geographical reference points with the same name and numerous buoys with the same numbers and characteristics (e.g., M1A). When passing a bearing between charted objects the watchstander should state whether the bearing is either true or magnetic and ensure that the mariner understands the difference. ***When a bearing using charted buoys is provided, the mariner shall be advised that this bearing was obtained from the buoy's charted position, which could differ from the actual location.*** It should also be pointed out to the mariner that this "bearing" is not a course to steer. ***Compass courses shall never be given because of the unique aspects of deviation, wind and current. If a compass course to steer is specifically requested, the following statement shall be passed to the mariner:***

"Captain, we understand your request for steering directions, but because we do not know the affects of winds and seas on your vessel or any error you may have on your compass, we cannot calculate a safe course for you to steer to _____."

Note: If a Coast Guard unit is escorting a vessel, courses to steer may be provided by the escort unit if by not doing so, the escorted vessel would be put in imminent danger.

4.5.2.5 Unable to Determine Position. If the mariner's general position cannot be determined, particularly in reduced visibility, the best course of action may be to suggest that the lost/disoriented mariner anchor the vessel if it is not in or near a major shipping channel, and the on scene conditions safely permit. If anchoring is not an option, the mariner should attempt to stay in the same position if deemed to be in safe water. If warranted, a communications schedule should be established with the vessel.

4.5.2.6 If the situation escalates from the uncertainty phase to the alert phase due to apprehension for the safety of the mariner, then dispatching a Coast Guard asset to locate and assist the lost/disoriented boat before a distress situation evolves may be the most prudent course of action. Important considerations include deteriorating weather, time of day, mariner's navigational competence, age and health of those on board, and size of vessel.

4.5.3 Hazardous Bars and Inlets

The Coast Guard may receive a request for advice on whether to enter an inlet or breaking bar during hazardous weather conditions. ***If a unit receives such a request, its first response shall be to advise the mariner to have all personnel aboard put on their PFDs.*** Generally, if the vessel is presently not in danger, it may be prudent to tell the vessel's operator not to attempt entering (or leaving) port until the weather moderates. "When in doubt, stay out" is good advice. If the mariner elects not to heed the advice and decides to put the vessel in a potentially hazardous situation, then consideration should be given to maintaining a communications schedule with the vessel until it is out of harm's way. Additionally, this may be treated as a potential distress case; the SMC should evaluate the possibility of dispatching a Coast Guard resource to stand by or provide a precautionary vessel escort. The following text is recommended as a standard reply:

> "Captain, we recommend each person on board put on a life jacket immediately. Because we do not know the capabilities of your vessel or the exact on scene conditions, we cannot advise you to attempt crossing the bar/inlet. If you have doubt about your vessel's ability to safely cross the bar/inlet then you should not attempt the crossing."

4.5.4 Weather Information

If mariners request weather forecast information, they should be advised of the local VHF-FM frequency or channel where they can find continuous National Weather Service (NWS) broadcasts. If the mariner is unable to receive the NWS broadcasts, the latest NWS weather warnings for the local area may be read over the radio, operations and time permitting. If this is done, ensure that the entire text is read exactly as written, including the period and geographic area for which the forecast is valid. Actual observed conditions of wind direction/velocity, visibility, cloud cover and sea height may be also relayed. Observations made with a calibrated weather instrument may be reported as is while all other observations should be reported as "observed". Whenever weather conditions are reported, the date, time and location of the observation should also be included.

4.5.4.1 Coastal Warning Displays (Weather Flags) at Coast Guard Units. The requirement to maintain coastal warning displays (weather flags during the day and light signals at night) was

eliminated by Commandant Directive in the late 1980s. In 2007 a program was put in place to have one boat station per sector again display the flags. These mandatory units are to be designated by the Sector Commander. Additional units have on their own kept or reinstated the tradition of displaying the flags as a service to their communities. This section provides service-wide policy and direction for daytime coastal warning displays (weather flags) for these locations where district commanders deem it appropriate to do so. Nighttime light displays are not authorized. ***Weather flags shall not be displayed by Coast Guard units except as provided in this section.***

(a) ***Units that display weather flags must do so in accordance with the warnings in force for their location as established by the National Weather Service and the scheme published in the United States Coast Pilot. Units that display weather flags must:***

(1) ***Not rely upon ready crews to raise and lower flags***.

(2) ***Display flags as required from an hour before sunrise to an hour after sunset. For units with lighted flag poles that display the national ensign 24 hours a day, these flags will also be displayed 24 hours a day.***

(3) ***Have a unit instruction in force that establishes and articulates the method used to promptly notify and direct the appropriate watchstander to raise and lower flags when National Weather Service advisories change.***

(4) ***Ensure sufficient guidance and training is in place such that watchstanders and other personnel understand and are able to promptly display the correct signals***.

(5) ***Have an established method of displaying the flags such that they can be seen from a navigable waterway*** (no construction projects should be undertaken for the sole purpose of displaying weather flags).

(6) ***Record in the unit log which flags are displayed and the time and date when they were raised and lowered.***

(7) ***Have two complete sets of weather flags and a reliable source of supply for replacements***.

(b) ***For units that now display weather flags, District Commanders shall ensure***:

(1) Submission of a change to the unit's entry in the U.S. Coast Pilot indicating:

a. that the flags will be displayed at the unit;

b. the hours of the day during which they will be displayed (normally from an hour before sunrise to an hour after sunset);

c. and from what location on the unit grounds the flags will be flown.

(2) That NOS charts and marine weather service charts (published by the National Weather Service) are updated with the correct symbols and comments reflecting the daytime display of weather flags at the unit.

(c) All U.S. Coast Pilot entries should also include the following language at their conclusion:

"Weather flags are flown only at select Coast Guard stations to supplement other weather notification sources. Light signals corresponding to these flags are not displayed at night.

In all cases mariners should rely upon National Weather Service broadcasts as their primary source of government provided weather information."

(d) For units wishing to discontinue display of the weather flags: ***Districts Commanders shall ensure appropriate changes are made to the U.S. Coast Pilot, NOS charts and marine weather service charts***. After these changes are in effect, issue a notice to mariners to advise of the change 90 days before display is discontinued and keep it in effect for 120 days after the change has taken place.

(e) For units wishing to begin display of the weather flags: ***District Commanders shall ensure the provisions of Section 4.5.4.1(a) are met and ensure that changes to the U.S. Coast Pilot, NOS charts and marine weather service charts are made as per Section 4.5.4.1(b) and that a Notice to Mariners advising of the change is issued as of the date of the change and remain in effect for 120 days after***.

Section 4.12
SAR and Security Concerns

4.12.1 Non-Immigrant Security Concerns

In carrying out our SAR mission we routinely MEDEVAC persons from vessels to the US for emergency medical treatment and bring other SAR incident survivors into the US. ***In such cases where the individual(s) are not believed to be US citizens or US permanent resident aliens, the SMC shall notify immigration enforcement officials immediately to coordinate any law enforcement issues.***

Section 4.13
Maritime Law Enforcement and Vessel Safety

4.13.1 Vessel Safety Law Enforcement

Vessel safety law enforcement supports the overall goal of promoting the safety of life and property at sea and protecting the marine environment. In carrying out this mission, the Coast Guard's role primarily consists of ensuring compliance with laws and regulations through enforcement action and educating members of the maritime industry and the boating public. Specific guidance regarding vessel safety law enforcement, including terminating voyages is contained in Reference (o).

4.13.2 Safe Operation founded in Law

Titles 33 and 46 of the United States Code and other U.S. laws, international laws, and treaties promote the safe operation of commercial and recreational vessels. The Safety of Life At Sea Convention (SOLAS) and associated Protocols establish international standards for seaworthiness and carriage of life saving equipment.

4.13.3 Manifestly Unsafe Voyage

Pursuant to authority contained in 33 CFR 177.04, the District Commander may declare a U.S. recreational or uninspected passenger vessel to be engaged in a Manifestly Unsafe Voyage.

4.13.4 Termination

Violations of law and treaties that create an especially hazardous condition may subject U.S. recreational and uninspected passenger vessels to voyage termination under 33 CFR Part 177. Termination is authorized when one or more specifically defined unsafe conditions exist, they cannot be corrected on the spot, and continued operation of the vessel constitutes an especially hazardous condition. Procedures regarding voyage termination, including authority to terminate the voyage of an uninspected commercial fishing vessel, are discussed in Reference (o).

4.13.4.1 Termination order and additional considerations. The goal of termination is to protect the safety of the persons onboard the vessel and the maritime public. Once the decision to terminate a voyage has been made, Boarding Officers may need to consider additional actions necessary to alleviate the especially hazardous condition (e.g., removing passengers and/or cargo from the vessel, escorting or towing the vessel to port). ***An intoxicated operator shall not be directed or permitted to operate the vessel.***

4.13.4.2 Termination and the Commercial Fishing Industry Vessel Safety Act (CFIVSA), 46 USC 4501-4508.

(a) The CFIVSA establishes a national program to reduce commercial fishing vessel losses and fatalities. Pursuant to, regulations prescribing equipment and operational requirements for U.S. fishing, fish processing and fish tender vessels have been promulgated in 46 CFR Part 28. It is beyond the scope of this Addendum to describe elements and enforcement policy associated with each of these regulations. The most significant regulatory

requirements are contained in Reference (cc).

(b) Violations of the CFIVSA that create an especially hazardous condition may subject the boarded vessel to voyage termination under 46 CFR Part 28.

4.13.4.3 Termination and SAR considerations. Based on the situation, the Coast Guard's response to a vessel termination should be assigned the appropriate SAR phase.